

Pearce, Jennifer

From: Janovitz, Sara
Sent: Wednesday, August 26, 2015 8:37 AM
To: Pearce, Jennifer
Subject: Raleigh FOIA
Attachments: City of Raleigh Public Utilities - Response to Questions; Re: City of Raleigh Public Utilities - Response to Questions; Fw: [Possible VIRUS!] RE: Raleigh Updates; Raleigh NOV; RE: Raleigh NOV; RE: Raleigh NOV; RE: Raleigh NOV; RE: Raleigh NOV; RE: Raleigh NOV; City of Raleigh - Question; FW: City of Raleigh - Question; RE: City of Raleigh - Question; RE: City of Raleigh - Question; NOV Question; RE: City of Raleigh - Question; RE: City of Raleigh - Question; RE: City of Raleigh - Question; City of Raleigh - Question; RE: City of Raleigh - Question; Raleigh NOV Response Question; Re: City of Raleigh - Question; RE: City of Raleigh - Question; FW: Notice of Violation

Jennifer-

Here are the emails I have in my outlook. I also have some other paper documents from my folder that should be included in the FOIA responses (do you want the whole folder?). Where do you sit so I can bring this down to you?

Thanks,

Sara Schiff Janovitz

Environmental Engineer
NPDES Permitting and Enforcement Branch
US EPA - Region 4
61 Forsyth Street, SW
Atlanta, GA 30303
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Pearce, Jennifer

From: Lynch, TJ <TJ.Lynch@raleighnc.gov>
Sent: Friday, January 04, 2013 4:32 PM
To: Janovitz, Sara
Cc: Waldroup, Kenneth; Carman, John; McLawhorn, Dan; Vessie, Matthew P.; Johnson, Tom; Brower, Aaron
Subject: City of Raleigh Public Utilities - Response to Questions
Attachments: Response to EPA Questions related to our initial CEI response.DOC; CORPUD Sewer Maintenance CCPs - DOPs.pdf; ATT33051.txt

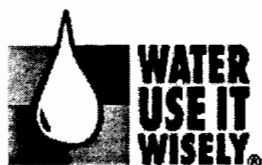
Hello Sara,

Please find attached our responses to your questions as well as supporting documentation in a second attachment. If you have any further questions, please do not hesitate to ask.

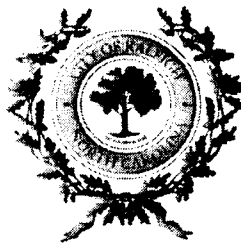
Sincerely,

T. J. Lynch

Assistant Director
Public Utilities Dept.
City of Raleigh
Office - (919) 996-2316
tj.lynnch@raleighnc.gov
www.raleighnc.gov



Please consider the environment before printing this e-mail.



City Of Raleigh

NORTH CAROLINA

December 28, 2012

Sara Schiff
Environmental Engineer
Clean Water Enforcement Branch
US EPA Region 4
61 Forsyth Street
Atlanta, GA 30303

Subject: Re: Raleigh Updates – Answers to Questions Emailed to Kenneth Waldroup on
December 11, 2012

Sara,

Please find our responses below to each of your questions as they are listed.

Q1. What is the status (i.e., when was/will the work begin; how much progress has been made; when will the work be finished) of the capital improvements on Marlowe Road? Raleigh's CEI response said the improvements were scheduled to begin in March 2012 and be completed by the end of 2013. (Pages 8 and 9)

A1. The rehabilitation/replacement project hereinafter referred to as "Rehabilitation of the Crabtree Creek North Bank Sewer" began ahead of schedule in February 2012. This \$9.1 Million dollar project includes: slip lining of 3,648' of 30" 1950s vintage reinforced concrete pipe (rcp), slip lining of 19,336' of 36" rcp, and replacement of 3,912' of 36" rcp. While this project is primarily a structural rehabilitation project, the friction coefficient of the centrifugally cast fiber reinforced polymer mortar pipe (HOBAS) will provide for some increase in capacity over the dilapidated concrete pipe. This project is approximately 88% complete and is on schedule to be completed in March 2013. The response on the schedule of the "final phase" project was misworded in our original response letter. The letter should have read, "and the final phase will begin by the end of 2013" instead of "be completed by" (accurate schedule is shown on Rothgebb Park response (page 13 of Raleigh's response)). The "final phase" listed in Raleigh's CEI response is in reference to the Crabtree Creek Basin Wastewater System Conveyance Improvements Project (CCBWWSCIP), which is discussed in more detail in the response to Q5.. Note from Susan – unless the CCBWWSCIP

One Exchange Plaza
1 Exchange Plaza, Suite 1020
Raleigh, North Carolina 27601

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Post Office Box 590 • Raleigh
North Carolina 27602-0590
(Mailing Address)
Printed on Recycled Paper

Municipal Building
222 West Hargett Street
Raleigh, North Carolina 27601

Sewer Maintenance Utility Management System

Critical Control Points (CCPs) and Departmental Operating Procedures (DOPs)

I. Critical Control Points (CCPs) - DRAFTS

1. CCTV Inspections
2. Easement Maintenance
3. Safety
4. Sanitary Sewer Overflows (SSOs)
5. Sewer Cleaning
6. Sewer Main/Service Repairs in Roadways
7. Sewer Main Easements Repair

II. Departmental Operating Procedures (DOP) - DRAFTS

A. Easement Maintenance & Inspections

Inspections

1. EMI-0001 Creating Work Orders from Inspections
2. EMI-0002 Assessment of Easement Condition
3. EMI-0003 Assessment of Sewer Structures
4. EMI-0004 Field Adjustments to GIS Basin Maps

Maintenance

5. EMI-0005 Planning for Easement Maintenance
6. EMI-0006 Easement Clearing Using a Tractor with Grinder
7. EMI-0007 Easement Clearing Using a Tractor with Mower
8. EMI-0008 Easement Clearing Using Brush Trimmers
9. EMI-0009 Easement Clearing Using Chain or Pole Saws
10. EMI-0010 Wood Chipping Equipment
11. EMI-0011 Herbicide Application
12. EMI-0012 Post Maintenance Site Restoration
13. EMI-0013 Environment Permit & Storm Water Project

B. Sewer Maintenance

1. SM-0001 Flushing
2. SM-0002 SSO Response

C. Sewer Easement Repair

1. SER-0001 Bank Stabilization
2. SER-0002 NC One-Call Procedure
3. SER-0003 Backfill Compaction
4. SER-0004 Installation and Replacement of Sanitary Sewer Manholes
5. SER-0005 Temporary Gravel Construction Entrance/Exit

D. CCTV Inspections

1. CCTV-0001

CCP	Operational Controls	Regulatory Risks	Environmental Impacts	Health & Safety Risks	Water Quality Risks	Interested Parties	Legal & Other Requirements	Responsible Party
CCTV Inspections	Condition Assessment	More SSO'S	Surface Water Pollution Walking Trails Recreational Areas Cross Connections with Storm Sewer	Utility Bores Gasses Cave in from pipe failure Back - ups into customer properties		Developers Engineering Customers	PU Handbook for new installations Sewer Use Ordinance	CCTV Supervisor
	CCTV Truck Operation	Could cause SSO	Surface Water Pollution	Working around manholes			Permit does not spell out CCTV requirements	CCTV Supervisor
	Data Review/Records • Verification of cleaning program	Self Defense of cleaning program and of resolution of SSOs				DWQ EPA Engineering Management Contractors		ORC
	Scheduling					Engineers (internal/external) Developers City Departments	PU Handbook	CCTV Supervisor

Risks Requiring Control	Critical Control Points	Operational Controls	Regulatory Risks	Environmental Impacts	Health & Safety Risks	Water Quality Risks (In Pipe)	Interested Parties	Legal & Other Requirements	Responsible Party
Easement Maintenance	Clearing	<ul style="list-style-type: none"> Chainsaw¹ Pole saw Gyro Trac Bush hog Weed eater Site Restoration¹ Surveying 	Permit requires maintenance of easements once per 10 years. Language does not specify clearing requirement.	<ul style="list-style-type: none"> Easement damage due to Gyro Trac Herbicide treatment Equipment crossing creek 	<ul style="list-style-type: none"> Environmental* Equipment/Tools Weather related** Flammables Traffic control 	Planning damage prevention to volatile pipes and manhole structures during access	<ul style="list-style-type: none"> Public/HOAs Consumers COR departments COR Council CAC Media DENR, DWQ, EPA, OSHA Army Corps of Engineers Code Enforcement 	<ul style="list-style-type: none"> Tree removal (Contracts -internal & external) Herbicide application certification Collections Permit Consultant (Dewberry)-Permitting 	Easement Utilities Supervisor III
	Inspections	<ul style="list-style-type: none"> Inspection process Trouble calls Documentation Permitted Buffer Zone Projects¹ 	Permit requires inspections of 100% of easements annually; Parallels & streams, aeriels, and siphon boxes bi-annually.	<ul style="list-style-type: none"> Discovery of active SSO Discovery of potential/preventable SSO 	<ul style="list-style-type: none"> Environmental* Weather related** Atmospheric*** Independent field work Ladder and climbing work 	<ul style="list-style-type: none"> Illegal discharging into collections system I & I 	<ul style="list-style-type: none"> Public/HOAs Consumers COR departments DENR, DWQ, EPA Code Enforcement 	<ul style="list-style-type: none"> Collections Permit Trespassing issues 	Easement Utilities Supervisor III
	Investigative Operations	<ul style="list-style-type: none"> Smoke machine Liquid smoke Communication: public/RFD Dye Testing 		Reference MSDS	<ul style="list-style-type: none"> Traffic control Chemical exposure Environmental* Atmospheric*** Flammables 		<ul style="list-style-type: none"> Public Fire Dept./Police Engineers DENR, DWQ, EPA Consumers COR departments Code enforcement 		Easement Utilities Supervisor III

¹ DOP may be employed in another division and should be considered for broader reaching DOP to address *Operational Controls*

² DOP should be a standard employed by Public Utilities to address other *Risks Requiring Controls*, *Critical Control points*, and subsequent *Operational Controls*

* **Environmental Health & Safety Risks** include, but are not limited to: Insects (biting & stinging), spiders & ticks (diseases transferred by tick such as Lyme, Rocky Mountain Spotted Fever, etc.), snakes, animals (wild, feral, & domesticated), barbed plants, poisonous plants (urushiol), widowmakers, marsh and other wetland areas.

** **Weather Related Health & Safety Risks** include, but are not limited to: Heat related injuries (heat cramps/exhaustion/stroke), cold related injuries (hypothermia, frostbite/frost nip, chilblains, trench foot), inclement weather, road conditions.

*** **Atmospheric Health & Safety Risks** include, but are not limited to: Hydrogen sulfide, methane, ammonia, and other sewer related gases.

CCP	Operational Control	Regulatory Risks	Environmental Impacts	Health & Safety Risks	Water Quality Risks	Interested Parties	Legal & Other Requirements	Responsible Party
SAFETY	Traffic Control	DOT Requirements City Safety Office Department Inspections Merger Towns Requirements		Public Safety Employee Safety		DOT Merger Towns Customers <ul style="list-style-type: none"> • Emergency Services • Bus Routes • Sanitation Routes • Schools 	DOT Requirements	Safety Officer
	Atmospheric Testing	OSHA		Employees				Safety Officer

[illegible]

[illegible]

CCP	Operational Controls	Regulatory Risks	Environmental Impacts	Health & Safety Risks	Water Quality Risks	Interested Parties	Legal & Other Requirements	Responsible Party
Sewer Cleaning	FlushVac Truck Operation	DOT <ul style="list-style-type: none"> Spills CDLs w/ endorsements Weight limit 	SSOs	Bio-hazards High pressure water Loose hose dangers Noise		DOT EPA DWQ Merger Towns Officials News Media Customers Upper Management Down Stream Users	Collections Permit <ul style="list-style-type: none"> Footage D.O.T. Rules Sewer Use Ordinance	ORC
	Disposal Requirements	DOT DWQ Solid Waste	Water Pollution	Safeguards from public Employee safety		Mr. Williams		ORC
	Data Review/Records <ul style="list-style-type: none"> Flushing Records Footage Maps 	DWQ EPA				EPA DWQ Management	Collections Systems Permits	ORC


	Operational Controls	Regulatory Risks	Environmental Impacts	Health & Safety Risks	Water Quality Risks	Interested Parties	Legal & Other Requirements	Responsible Party
Sewer Cleaning	<i>Chemical Root Control</i>	Handling Storage Disposal	Surface Waters • Toxic	Employee Exposure • Carcinogenic	Toxicity to the Treatment Plant Biology	Treatment Plant ORC Environmental Groups	NPDES Permit for the WWTPs	ORC
	<i>Scheduling (SEE CCTV FOR ALL)</i>							

CCP	Operational Controls	Regulatory Risks	Environmental Impacts	Health & Safety Risks	Water Quality Risks (inside pipe)	Interested Parties	Legal & Other Requirements	Responsible Party
Sewer Main/Service Repairs in Roadways	PLANNING	DOT OSHA	EXCAVATED SOIL DISPOSAL TRENCH DE-WATERING	TRENCHING AND SHORING	TRENCH DE-WATERING	DWQ	PU UTILITY CODE HANDBOOK	South Raleigh Ass't. Supt.
	<ul style="list-style-type: none"> PERMITS NOTIFICATIONS TRAFFIC CONTROL PLAN UTILITY LOCATES MAPPING REQUISITIONS CONTRACTORS VS. UTILITY 			ATMOSPHERIC TESTING	SURFACE WATER RUNOFF	NCDENR	MUNI CODE	
				TRAFFIC CONTROL		OSHA	STREET CUT PERMITS	
				PEDESTRIAN CONTROLS		EPA	ROAD CLOSE PERMITS	
				OTHER UTILITIES (PSNC, etc)		COR STORM WATER	811-NC ONECALL	
	MOBILIZATION					MERGER TOWNS		
	<ul style="list-style-type: none"> TRAFFIC CONTROL ROAD CLOSURES 					PARKS AND REC	DWQ & DENR PERMITS	
						ENGINEERING		
						EMPLOYEE		
						PUBLIC		
REPAIR						LEGAL		
<ul style="list-style-type: none"> SAW CUT EXCAVATING SPOIL DISPOSAL PIPE/APPURTENANCES REPAIR EMERGENCY CONTRACTOR ASSISTANCE 						CODE ENFORCEMENT		
						STREET DEPT.		
BACKFILL/ COMPACTION						COMMUNICATION CENTER		
<ul style="list-style-type: none"> BEDDING OF PIPE BACKFILL MATERIALS/ SCREENING 						CONTRACTORS		
DEMOBILIZATION						CONSULTANTS (Dewberry)		

	<ul style="list-style-type: none"> • CLEAN-UP • NOTIFICATIONS 							
CCP	Operational Controls	Regulatory Risks	Environmental Impacts	Health & Safety Risks	Water Quality Risks (inside pipe)	Interested Parties	Legal & Other Requirements	Responsible Party
Sewer Main Easements & Repair	PLANNING <ul style="list-style-type: none"> • CODE ENFORCEMENT (RESEARCH) • SURVEY • NOTIFICATIONS (stakeholders) • PERMITTING • ACCESS MOBILIZATION REPAIR BACKFILL/ COMPACTION DEMOBILIZATION	DWQ NCDENR OSHA EPA	RESTORATION OF DISTURBED WORK ZONE/EASEMENT EROSION CONTROL <ul style="list-style-type: none"> • MATTING • WILLOW STAKING • STREAM ARMORING • SEED & STRAW • SILT FENCE • GRADING • CHECK DAMS ACCESS ROADS STREAM CROSSING	TRENCHING AND SHORING ATMOSPHERIC TESTING INSECTS/POISONOUS PLANTS AND ANIMALS SLIPS TRIPS AND FALLS	Same as above	Same as above	Same as above	South Raleigh Ass't. Supt.

DRP

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
	NUMBER EMI-0001	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 1 4
SUBJECT Sewer Maintenance; Easement Program; Inspections Creating Work Orders from Inspections	SUPERSEDES		PREPARED BY Easements	Approved by

1.0 **PURPOSE:**

To describe the process for completing a work order to address an identifiable problem. The work order should have certain standardized elements to avoid confusion.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Repairs
- Flushing & Maintenance
- CCTV
- Requests & Complaints (formerly Cutting)

Administrative Division:

- Code Enforcement
- GIS

External:

- Tree Removal Contractor
- Environmental Consultants

3.0 **REFERENCE:**

Black's Law Dictionary, Third Edition, 2006

Operation and Maintenance of Wastewater Collection Systems: Volume 1: 6th Ed.

4.0 **PROCEDURE:**


Issues regarding the condition and/or performance of either the collection system or of the sanitary sewer easements that requires maintenance, intervention, or other corrective action, must be addressed in work order form. Persons performing easement and structure inspections need to use the same work order format to avoid confusion or misinterpretation.

To avoid confusion, work orders need to be issued individually for each:

- Address/easement
- Drainage basin
- Work groups (flushing & maintenance, CCTV, code enforcement, tree removal contractor, GIS, environmental consultants, and repairs)

For example, identical issues in two separate basins warrants two individual work orders as does an address in the same basin that has two separate issues.

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual				
	SUBJECT Sewer Maintenance; Easement Program; Inspections Creating Work Orders from Inspections	NUMBER EMI-0001 SUPERSEDES	REV 1 PREPARED BY Easements	EFFECTIVE DATE Sept 2012 Approved by	
		PAGE 2	OF 4		

4.1. The work order must clearly identify the following:

- a. In which drainage basin the issue is located.
- b. The type of sewer structures that are involved with the issue (aerial, outfall, force main, manhole, or siphon).
- c. Designate whether the issue is in a residential or non-residential area.
- d. The total of manholes that are directly affected in the issue area (if applicable).
- e. The total linear footage of the issue involved (if applicable).
- f. The priority, if *high*, regarding such issues of imminent failure of a sewer structures. Supervisor shall be informed of and determine that the work order warrants a *high* priority. All other prioritizing of work orders is performed by the supervisor.
- g. The GIS basin map number (i.e. QV 1057)

See **Figure 2**; callouts 5.1 (a-g) demonstrate the locations to provide the above information.

4.2. The address of the issue should be clearly marked in the appropriate column on the work order.

- h. The address should be the easement entry point or access point to locate the issue.


- ☒ In the case of code enforcement issues, the address needs to correspond with location of the infraction so code enforcement can take appropriate action with the identified addressee.

See **Figure 2**; callout 5.2 (h) demonstrates the location to provide the above information.

4.3. For ease of the work groups to locate and identify the issue:

- i. The work order should describe the location of the issue in relation to the address provided.
- j. Followed by a description of the issue and a suggestion of how to resolve the issue.

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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- k. Lastly, for assisting staff to locate the address provided, a street guide map page and block should be included.

See **Figure 2**; callouts 5.3 (i-k) demonstrate the locations to provide the above information.

- 4.4. To complete the work order the following should be provided at the bottom of the work order:
- l. The date the work order was generated
 - m. The person who performed the inspection
 - n. The work group the work order is being issued for; this should be highlighted with the color assigned to that work group. See color designation table, **Figure 1.** below)


Sewer Maintenance - All Work Groups	
Code Enforcement	Cutting Crews
Repairs	Environmental Consultants
Tree Removal Contractor	GIS


Figure 1

See **Figure 2**; callouts 5.4 (l-n) demonstrate the locations to provide the above information.

- 4.5. Once the work order is completed, it must be transferred to the person responsible for data entry, review, prioritization, and eventual release as designated by the Easement Maintenance Manager.
- 4.6. Retaining copies of work orders is the responsibility of the person creating the work order.

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
	SUBJECT Sewer Maintenance; Easement Program; Inspections Creating Work Orders from Inspections	NUMBER EMI-0001 SUPERSEDES	REV 1 PREPARED BY Easements	EFFECTIVE DATE Sept 2012 APPROVED BY




CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT

<div style="border: 1px solid black; padding: 5px;"> 5.1. a. <input type="checkbox"/> Little Brier Creek <input type="checkbox"/> Sycamore Creek <input type="checkbox"/> Turkey Creek <input type="checkbox"/> Hare Snipe Creek <input checked="" type="checkbox"/> Mine Creek <input type="checkbox"/> Wildcat Branch <input type="checkbox"/> Big Branch South <input type="checkbox"/> Perry Creek <input type="checkbox"/> Big Branch Creek </div>	<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> Marsh Creek <input type="checkbox"/> Crabtree Creek <input type="checkbox"/> Richland Creek <input type="checkbox"/> Rodchester Heights <input type="checkbox"/> House Creek <input type="checkbox"/> Rocky Branch <input type="checkbox"/> Neuse River <input type="checkbox"/> S.W. Beaver Dam <input type="checkbox"/> Pigeon House Creek </div>	<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> Walnut Creek <input type="checkbox"/> Bushy Branch <input type="checkbox"/> Southgate Tributary <input type="checkbox"/> Simmons Branch <input type="checkbox"/> E. Beaver Dam <input type="checkbox"/> White Oak <input type="checkbox"/> Upper Swift <input type="checkbox"/> Lower swift <input type="checkbox"/> Benson </div>																								
<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> Aerial <input type="checkbox"/> Outfall <input type="checkbox"/> Force Main <input checked="" type="checkbox"/> Manhole <input type="checkbox"/> Siphon Residential <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No Manholes <u>2</u> Footage <u>175'</u> Priority <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low Map Page <u>QV 1171</u> </div>																										
<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 40%;">Description / Address</th> <th style="width: 60%;">Comments</th> </tr> </thead> <tbody> <tr> <td>105 BITTERSWEET CT</td> <td>MH REAR/RIGHT OF ADDRESS HAS GREASE AND ROOTS. ALSO, NEXT MH DOWNSTREAM HAS GREASE. FLUSH LINE BETWEEN MHs.</td> </tr> <tr> <td></td> <td>STREET GUIDE PAGE: 54-P</td> </tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>			Description / Address	Comments	105 BITTERSWEET CT	MH REAR/RIGHT OF ADDRESS HAS GREASE AND ROOTS. ALSO, NEXT MH DOWNSTREAM HAS GREASE. FLUSH LINE BETWEEN MHs.		STREET GUIDE PAGE: 54-P																		
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<div style="border: 1px solid black; padding: 5px;"> Date: <u>8 / 17 / 12</u> Inspected by: <u>JOHN SMITH</u> Reviewed by: _____ Assigned to: <u>SEWER MAINT.</u> </div>																										

Figure 2

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program; Inspections Assessment of Easement Conditions	NUMBER EMI-0002	REV 1	EFFECTIVE DATE Sept 2012	PAGE 1 OF 7
	SUPERSEDES	PREPARED BY Easements		Approved by

1.0 **PURPOSE:**

To identify the procedures for inspecting sanitary sewer easements for overall condition and accessibility. This DOP also describes the process for addressing issues as it pertains to easement conditions.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Repairs
- Flushing & Maintenance
- CCTV
- Requests & Complaints
- South Raleigh Operation

Water Distribution Division:

- North Raleigh Operations
- East Raleigh Operations

Administrative Division:

- Code Enforcement
- GIS

External:

- Customers/Homeowners/Business Owners
- Tree Removal Contractor
- Environmental Consultants
- NCDENR; DWQ
- EPA
- Division of Land Resources
- US Army Corps of Engineers


3.0 **REFERENCE:**

City of Raleigh Code Section 8-2012

Departmental Operating Procedure EMI-0001

Wetlands, Streams, Buffers, and Sanitary Sewer Maintenance Regulatory Requirements, Training Module, 2009; Dewberry®

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
	SUBJECT Sewer Maintenance; Easement Program; Inspections Assessment of Easement Conditions	NUMBER EMI-0002	REV 1	EFFECTIVE DATE Sept 2012
		PAGE 2	OF 7	APPROVED BY Easements

4.0 **PROCEDURE:**

Perform necessary preparation to access easement. Utilize GIS basin maps to determine sewer line configuration and easement entry points.

Use appropriate PPE for traversing easement and inspecting sewer structures. Basic PPE includes approved vest, gloves, and boots. Additional PPE as required by conditions and situations such as rain gear, snake guards, eye and ear protections, and hard hats.


At no time shall an employee enter a manhole during the inspection process; entering the manhole is crossing the plane of the top of the ring with any part or extension of the body.

- 4.1. Prior to accessing property/easement for inspections, attempt to contact homeowner, property management, or other responsible party to notify intent to inspect. For residential homes, knock on door in attempt to contact homeowner; for commercial properties and multi-family dwellings, use main office or leasing office to receive permission to access. At some locations, there are posted telephone numbers to call for accessing properties.
- 4.2. Open manholes in right-of-way (ROW), if safe to do so, to confirm a line does enter a property. Begin inspections process.
- 4.3. Identify and document any issues involving the condition of the easement that would affect the functions or the ability to maintain the collections system including:
 - Obstacles on easements that would prevent maintenance to sewer structures and the easement itself such as trees, heavy vegetation, and obstacles that are addressed by code enforcement,
 - Easement conditions such as sinkholes, washouts, beaver dams, and SSOs.

Trees on the Easement:

- 4.4. Trees on easements shall be counted (by footages and/or tally) and then documented on the GIS basin map. Tree removal can be performed both internally by the Requests & Complaints work group and externally by contractors.
 - Trees that require a contracted specialist include:
 - Tree removal poses risk of damaging property (i.e. structures, fences, utilities, etc.),
 - Trees exceeding 30' in height or 10" in diameter,
 - Projects with an increased risk to health & safety,
 - A need for specialized skill and/or equipment,
 - Other factors that would allow the City of Raleigh to be held liable.

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL			
	Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program; Inspections Assessment of Easement Conditions	NUMBER EMI-0002	REV 1	EFFECTIVE DATE Sept 2012	PAGE 3 OF 7
	SUPERSEDES	PREPARED BY Easements		Approved by

Generate a work order to perform the removal; work order specifications can be found in DOP EMI-0001. The work order should define:

- Linear footage of tree removal,
- Quantity of manholes in the affected range.
- Trees requiring removal that does not meet the requirements for a tree removal specialist mentioned above, can be handled internally by qualified staff. No work order is required.

Heavy Vegetation on the Easement:

- 4.5. Easements requiring clearing of vegetation shall be documented on the GIS basin map. Easement clearing of vegetation is handled internally by the Requests & Complaints work group.

Vegetation on the easement does not require a work order except in special circumstances such as:

- Vegetation preventing access to easement for inspections.
- Heavy vegetation that conceals structures preventing proper inspection.
- Maintenance work that would require vegetation to be cleared prior to the start of the work.

Generate a work order to perform the clearing; work order specifications can be found in DOP EMI-0001. The work order should define:

- Linear footage (lengthwise) of easement needing be cleared,
- Quantity of manholes in the affected range.


Code Enforceable Obstacles on the Easement:

- 4.6. Code enforceable obstacles on the easements shall be documented on the GIS basin map describing the obstacle and if applicable, the footage shall be notated. Obstructions are addressed through the Code Enforcement division.

- Code enforceable objects include but are not limited to:
 - Buildings, houses, decks, garages, tool & storage sheds, swimming pools, walls, and fences,
 - Air conditioning units and heat pumps,
 - Planted trees & shrubs.
- Refused access to the easement by property owner is also handled by Code Enforcement.

Obtain the address of the property the obstacle is on; it is imperative that the

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address is correct so Code Enforcement can follow up with the responsible parties.

- Cross reference the address and obstacle details to the master code database (a copy of this shall be provided to each inspector for the basin they are working in).
 - If the address and obstacle has been correctly identified on the master database, no work order is required.
 - If the address is listed on the database but the information is incorrect, a work order shall be generated. Clearly state on the work order that the address is on the database but requires updated/corrected information; provide the updated/corrected information.
 - If the address and obstacle are not on the database a work order shall be generated.

Work order specifications can be found in DOP EMI-0001. The work order should define:

- Description of the obstacle and its relation to the easement,
- Linear footage of easement impacted by the obstacle,
- If applicable, the quantity of manholes affected by the obstacle.

Sinkholes:

- 4.7. Sinkholes can be indicative of a damaged sewer main and requires further investigation using resources such as CCTV.


Investigate the suspect sinkhole to rule out that the void space is not:

- An intentionally dug out surface,
- Drainage washing/eroding surface,
- A vehicle tire rut,
- An animal burrow,
- A hollowed out tree stump,
- An explainable occurrence that does not impact the collection system.

Sinkholes on the easements shall be documented on the GIS basin map describing the dimensions (length x width x depth) and location of the sinkhole. Sinkholes are addressed by the CCTV and Repair work groups.

- i. An identified sinkhole shall be investigated by using CCTV methods to determine if the sewer main is damaged and allowing infiltration. A work order shall be generated.

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Work order specifications can be found in DOP EMI-0001. The work order shall define:

- The physical location of the manhole closest to the sinkhole for launching the CCTV equipment.
 - If the diameter of the sewer main is equal to or greater than 36" the location of the closest upstream manhole is required,
- The dimensions of the sinkhole (length x width x depth) and its relation to the easement, centerline of the sewer main, and/or proximity to sewer structures,
- The linear footage of the sewer main that CCTV will be inspecting,
- Quantity of manholes that will be involved in the inspection process,
- If the CCTV crew will need to take vehicle off road,
- The diameter of the sewer main.

- ii. If the sinkhole exceeds 2' x 2' x 1' (or exceeds 4 cubic feet of missing fill) the Repair group should fill the sinkhole to prevent personal injury or damage to vehicles. A work order shall be generated.

Work order specifications can be found in DOP EMI-0001. The work order shall define:

- Clear directions to the sinkhole location,
- The dimensions of the sinkhole so materials can be calculated for filling the sinkhole.

Easement Washouts:


- 4.8. Easement that is washing out shall be notated on the GIS basin map with linear footages, identified source of the washing, and any sewer structures that may be involved.

Causes of washouts can include but are not limited to:

- Storm drainage systems,
- Loose and unstable soils,
- Bodies of water.

Washouts will ultimately fall within one of two categories, permitted and non-permitted. Regardless of permitting, washouts are addressed by the Repair group.

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- Permitted projects are the projects that will have natural impact within one of the two *Buffer Zones* along a blue-line stream.
 - Buffer Zone 1 is the area of land from the top of the embankment extending 30' away from the embankment.
 - Buffer Zone 2 is the area of land from the edge of Buffer Zone 1 and extending 20' away from Buffer Zone 1.
- Non-permitted projects are the projects that will have **no** natural impact within one of the two Buffer Zones described above.

Washouts require a picture to be taken, clearly identifying the washout, any relation to a stream, and the location of the centerline of the sewer main (use of marking paint, flagging, etc.). A work order shall be generated.

Work order specifications can be found in DOP EMI-0001. The work order should define:

- The linear footage of the washout,
- Any sewer structures that are being affected by the washout,
- An identified source for the washing,
- Any special considerations for the use of heavy equipment such as saturated soils, shallow line depth, and easement access locations.

If the work is to be permitted, an identical work order shall be generated for the Environmental Consultants to examine the scope of the work.

Beaver Dams:

- 4.9. Identify the location of the beaver dam on the GIS basin map. Beaver dams are addressed by the Repairs group.


A work order shall be generated. Work order specifications can be found in DOP EMI-0001. The work order shall define:

- Location of the beaver dam,
- The impact of the beaver dam on the easement and/or sewer structures,
- The linear footage of the impact on the easement by the beaver dam,
- If applicable, the quantity of manholes in the affected range.

Sanitary Sewer Overflow (SSO):

- 4.10. Encountering an SSO will typically happen on or near the easement prior to finding the source of the spill. Identify the source of the sewer spill and immediately notify supervisor (the supervisor is to notify the Operator in Responsible Charge, ORC).

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Notate the SSO and its source on the GIS basin map.

From the inspections perspective, SSOs are addressed by the Sewer Maintenance group though *they* may enlist other groups such as CCTV and Repairs. A work order shall be generated.

Work order specifications can be found in DOP EMI-0001. The work order shall define:

- Location of the SSO,
- Any identified cause of the SSO,
- Quantity of manholes involved,
- Time supervisor was notified,
- Whether the spill was able to reach a body of water or drainage system that discharges into a body of water.

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1.0 **PURPOSE:**

To identify the procedures for inspecting sanitary sewer structures for condition, performance, and identification. This DOP also describes the process for addressing issues as it pertains to maintenance issues.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Repairs
- Flushing & Maintenance
- CCTV
- Requests & Complaints (formerly Cutting)

Administrative Division:

- Code Enforcement
- GIS

External:

- Customers/Homeowners/Business Owners
- Tree Removal Contractor


3.0 **REFERENCE:**

Black's Law Dictionary, Third Edition, 2006
Existing Sewer Evaluation and Rehabilitation, Third Edition, 2009
Exfiltration in Sewer Systems, Robert S. Amick P.E., 2000
Departmental Operating Procedure SM-E-0001
Departmental Operating Procedure SM-E-0002

4.0 **PROCEDURE:**

- 4.1. Perform necessary preparation to access easement for structure inspections. Utilize GIS basin maps to determine sewer line configuration and easement entry points.
- 4.2. Prior to accessing property/easement for inspections, attempt to contact homeowner, property management, or other responsible party to notify intent to inspect.
- 4.3. Use appropriate PPE for traversing easement and inspecting sewer structures. Basic PPE includes approved vest, gloves, and boots. Additional PPE as required by conditions and situations such as rain gear, snake guards, eye and ear

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protections, and hard hats.

- 4.4. Identifiable marks should demonstrate that structures have been inspected. This can include inverted marking paint, flagging, GPS coordinates, etc.
- 4.5. Issues found during inspections process may require work orders for corrective action to be taken. Specifications for generating work orders can be found in DOP SM-E-0001.
- 4.6. All issues must be notated on GIS basin map.
- 4.7. Inspection of SSMH exterior should identify:
 - SSMH is free of damage including any points of access for inflow & infiltration (I&I).
 - SSMH is above floodplain, being at least at-grade in elevation.
 - SSMH is not enclosed or covered by structure, fence, vegetation, trees, or other objects (i.e. birdbaths) that would prevent or hinder maintenance of the sewer structures.
 - Ring & cover (R/C) is free of extensive corrosion, fractures/cracks, or other significant damage.
 - Ring is centered and secured atop of SSMH.
 - Covers sits properly in ring and cam locks/bolts are able to turn easily.

SSMH exterior issues involving R/C, repair, digging up of, and/or raising of MH are addressed by sewer maintenance. Generate work order for issue.


SSMH exterior issues involving vegetation does not require a work order.

SSMH exterior issues involving trees should follow protocols for interior/exterior tree removal explained in DOP number SM-E-0002 procedures 5.6-5.7.

SSMH exterior issues involving structure, fence, or objects that would prevent inspection/maintenance should be addressed by code enforcement; code enforcement protocols can be found in DOP SM-E-0002 procedures 5.9-5.11.

- 4.8. Inspection of SSMH interior should identify:
 - Flow in trough is moving downstream; flow from manhole to manhole is logical (increasing with addition of services connected). Invert depths are

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logical with surface elevations and from manhole to manhole.

- Sediment build up in trough does not affect conveyance performance.
- SSMH should be free of damage, extensive corrosion, roots, or points or egress for exfiltration.
- Drop-off flows are not eroding SSMH walls, shelves, or troughs.
- Illegal or unidentified connections, utilities, discharges.
- Odors suggesting chemicals such as diesel fuel, or paint & thinners are being discharged into the collections system.
- Shelf & trough should be free of debris, foreign objects, excessive paper, FOG, and roots.
- Shelf and trough should be properly formed and sloped to prevent stagnant water or debris build-up.
- Any contractor plugs in the SSMH should be identified.

SSMH interior issues involving FOG, roots, or debris removal are addressed by sewer maintenance. Generate work order for issue.

SSMH interior issues involving MH installation, damage repairs requiring MH entry, eroding or poorly formed walls/shelves/troughs are addressed by repair groups. Take picture of issue and generate work order. If issue requires use of heavy equipment near bodies of water, follow permitting protocols described in DOP number SM-E-0002 Procedure 5.13.

SSMH interior issues involving illegal discharges & connections are addressed by code enforcement. Generate work order to correct issue.


SSMH interior issues involving plugs in active lines require code enforcement and sewer maintenance. Generate a work order for maintenance to retrieve the plug and for code enforcement to follow up.

4.9. Inspection of sewer vents should identify:

- Proper working order with no visible blockage such as bird nests.
- Appropriately secured to structure and all sections secured together.

SSMH vent issues are addressed by sewer maintenance. Generate a work order to

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correct the issue.

4.10. Inspection of aerials should identify:


- Condition of the supports, or need for support structures.
- Points of vertical and/or horizontal deflection.
- Pipe diameter, length of pipe exposure, pipe material, and if pipe is encased in concrete or has a protective casing pipe.
- If washout conditions risk further exposure of the pipe.
- Aerial should be assigned a numerical rank based on the principles of the *Aerial Inspection Standards* below:
 - 1 – Aerial meets current standards in its construction and is no danger of failure due to workmanship or material.
 - 2 – Aerial either 1) meets current standards in its construction but is showing signs of deterioration and may need attention in the future or 2) does not meet current standards in its construction but shows no signs of deterioration.
 - 3 – Aerial either 1) does not meet current standard in its construction or 2) does not meet the current standard (and) is in poor condition requiring repair or additional attention, but is in no immediate danger of failure due to workmanship or materials.
 - 4 – Aerial is in danger of failure due to workmanship or materials requiring repair and/or replacement, but does not meet requirements for immediate/imminent failure.
 - 5 – Aerial is in immediate and imminent danger of failure without prompt attention.

Aerial issues involving supports, deflection, and/or washouts are addressed by repair personnel. Take picture of affected area and generate work order. Use of heavy equipment near bodies of water needs to be permitted as defined in this DOP, procedure 5.16.

4.11. Inspection of siphon box exterior should identify:

- Siphon box should be free of damage including any points of access for inflow & infiltration (I&I).

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- Siphon box is above floodplain, being at least at-grade in elevation.
- Siphon box is not enclosed by structure, fence, vegetation, trees, or other objects that would prevent or hinder maintenance of the sewer structures.
- Siphon box ring & cover (R/C) or doors should be free of extensive corrosion, fractures/cracks, or other significant damage.
- Siphon box with doors should have a safety net installed to prevent accidental entry into the siphon box.

Siphon box exterior issues involving R/C or doors, repair, digging up of, and/or raising of siphon box are addressed by sewer maintenance. Generate work order for issue.

Siphon box exterior issues involving vegetation does not require a work order.

Siphon box exterior issues involving trees should follow protocols for interior/exterior tree removal explained in DOP number SM-E-0002 procedures 5.6-5.7.

Siphon box exterior issues involving structure, fence, or objects that would prevent inspection/maintenance should be addressed by code enforcement; code enforcement protocols can be found in SM-E-0002 procedures 5.9-5.11.

4.12. Inspections of siphon box interior should identify:


- Siphon box should be free of damage, extensive corrosion, roots, or points of egress for exfiltration.
- Shelf and trough(s) should be free of debris, foreign objects, excessive paper, FOG, and roots.
- Shelf and trough should be properly formed and sloped to prevent stagnant water or debris build-up.

Siphon box interior issues are addressed by sewer maintenance. Generate work order to correct issue.

4.13. Inspections of force main discharge location (where force main ties into gravity powered sewer) should identify:

- FOG issues.

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- Extensive corrosion from sewer gases.
- Excessive odor requiring odor control measures.

Excessive odor control issues can be addressed by sewer maintenance. Generate work order to correct issue.

Extensive corrosion issues can be addressed by repair groups. Take picture and generate work order to correct issue.

4.14. Inspections of pump/lift station should identify:

- Any abnormality visible from fence perimeter that would require contacting personnel from WWTP to service/maintain the pump station.

Notify supervisor of abnormality seen.

4.15. Inspections of service line connected into SSMH should identify:

- Service line is of appropriate construction methods and does not interfere with the conveyance of sewage.
- FOG & roots present from service line connection point or in the service line itself.


Service line issues that interfere with the functionality of the sewer system should be addressed by code enforcement. Take picture and generate work order to correct issue.

Service line issues pertaining to FOG and roots should be addressed by sewer maintenance with possible code enforcement involvement. Generate work order to correct issue.

4.16. Inspections of erosion issue areas should identify:

- Embankment stability.
- Risk of increased erosion and washout of sewer structure(s).
- Location of streams, creeks, river, or other bodies of water in relation to the sewer line/erosion issue. Issues that fall within Buffer Zones 1 or 2 require permitting:
 - Buffer Zone 1 is the area between the top of the embankment of the water body extending 30' away from the embankment.

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- Buffer Zone 2 is the area between the edges of Zone 1 extending 20' away from Zone 1.

Washouts and erosion issues *not* within Buffer Zones 1 or 2 are addressed by repair personnel. Take a picture of the affected area with marking (paint, flagging, etc.) demonstrating the relationship between the washout and the centerline of the pipe or other sewer structure. Generate work order to correct issue.

Washouts and erosion issues within Buffer Zones 1 or 2 require permitting and are addressed by repair personnel. Take pictures of the affected area with marking (paint, flagging, etc.) demonstrating the relationship between the washout, the centerline of the pipe or other sewer structure, and the body of water. Generate work orders for repairs and for permitting agency to correct issue.

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1.0 **PURPOSE:**

To identify the procedures for identifying map inaccuracies and submitting changes to be made on the GIS basin maps.

2.0 **ORGANIZATIONS AFFECTED:**

Geographic Information Systems (GIS)

3.0 **REFERENCE:**

Departmental Operating Procedure EMI-0001

Departmental Operating Procedure EMI-0002

4.0 **PROCEDURE:**

Perform necessary preparation to access easement for structure inspections. Utilize GIS basin maps to determine sewer line configuration and easement entry points.


Use appropriate PPE for traversing easement and inspecting sewer structures. Basic PPE includes approved vest, gloves, and boots. Additional PPE as required by conditions and situations such as rain gear, snake guards, eye and ear protections, and hard hats.

As described in DOP EMI-0002 procedure 4.1, verbal notification to access the property/easement for inspections should be given to the homeowner, property management, or other responsible party.

- 4.1. During the inspections process, compare the GIS basin map to what is being inventoried in the field. Sewer structures on the map should be accurate as to what is being found. Use map details of building footprints, roads, bodies of waters and other details to form conclusions on the accuracy of the current GIS basin map.
- 4.2. GIS basin maps use symbols, lines, and colors to identify sewer structures; the collection system should be displayed accurately on the map. Unidentified or misidentified sewer structures should be corrected and submitted for revisions.

- Flow direction arrows should accurately demonstrate flow movement.
- Configuration and location of the sewer structures should be represented accurately.
- Aerial symbols should demonstrate accurate length in proportion to the map

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scale.

- Sewer line symbols and line types should demonstrate accurate status of sewer structures (active versus abandoned; public versus private).
- Sewer main diameter & material notations should demonstrate accurate sizes & materials

4.3. During inspection of sewer structures:

- Identify sewer main(s) not depicted on map. Follow the line(s) to their respective dead end manholes through inspection process. Notate best approximation of sewer structure locations and geometry.
- Aerials found during inspections, not depicted on map, must be documented; aerial diameter, length, and material need to be specified along with an accurate location of the aerial itself.
- Sewer structure(s) found during inspections, not depicted on map or depicted with incorrect symbol(s) must be documented with correct location and/or symbol.
- Inaccurate configuration and/or geometry of sewer structures must be corrected.
- Flow directions must depict the correct direction of the flow of sewage.
- Sewer structures depicting incorrect status (live or abandoned/public or private) needs to be corrected.


4.4. All corrections must be notated on the GIS basin map.

4.5. To issue correction change(s) to the GIS division, a work order must be generated. Specifications for completing work orders can be found in DOP EMI-0001.

4.6. The GIS division expects changes to be made in an orderly way along with a copy of the GIS basin map highlighting the inclusions, exclusions, and/or errors requiring correction.


- All field observations must be transferred to a copy of the GIS basin map that has no written notes or other additional information.
 - Per GIS staff, the work order should give the briefest explanation of the change required, to avoid confusion.

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- Per GIS staff, all corrections on the GIS basin map should be communicated with simple symbols accepted by GIS staff.
 - All corrections on the GIS basin map should be highlighted in pink.
 - To improve readability for GIS staff and to decrease chance for interpretation errors, the following shall be performed:
 - Each change should have a circled number (①, ②, ③, etc.) placed to the left of the address on the work order. A matching circled number shall be placed next to the corresponding correction on the map.
 - Both circled numbers shall be highlighted in pink.
- 4.7. Retaining copies of work orders and corresponding basin map is the responsibility of the person completing the work order and map.

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1.0 **PURPOSE:**

To provide instructions for the planning of easement clearing operations.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Repairs
- Flushing & Maintenance
- CCTV
- Requests & Complaints
- South Raleigh Operations

Water Maintenance Division:

- North Raleigh Operations
- East Raleigh Operations

Administrative Division:

- Code Enforcement

External:

- Customers/Homeowners/Business Owners
- Tree Removal Contractor
- DWQ/ NCDENR

3.0 **REFERENCE:**


Black's Law Dictionary, Third Edition, 2006

Existing Sewer Evaluation and Rehabilitation, Third Edition, 2009

Wetlands, Streams, Buffers, and Sanitary Sewer Maintenance Regulatory Requirements,
Training Module, 2009; Dewberry®

Operation and Maintenance of Wastewater Collection Systems: Volume 1: 6th Ed
Departmental Operating Procedure SM-E-0010

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4.0 **PROCEDURE:**

- 4.1. Personnel assigned to coordinate the following procedures shall be determined by the Supervisor of the Maintenance Program.
- 4.2. Determine if the easement to be cleared falls within one of the designated *Raster Zones*.
- 4.3. Code enforcement must determine that an easement exists.


For easements being regularly maintained & easements *not* located within a *Raster Zone*:

- 4.4. Easement boundaries that are not clearly defined require surveying services to establish boundary locations. City of Raleigh Public Works handle surveying requests; if surveys are unable to be handled internally, it may be required to contract with an external surveyor.
- 4.5. After boundary locations are (re)established:
 - A site inspection shall be performed to determine if external tree removal services are required. The risk factors for determining the need for tree removal specialists include:
 - Tree removal poses risk of damaging property (i.e. structures, fences, utilities, etc),
 - Trees exceeding 30' in height or 10" in diameter,
 - Projects with an increased risk to health & safety,
 - A need for specialized skill and/or equipment,
 - Other factors that would allow the City of Raleigh to be held liable.

Tree(s) requiring removal that do not meet any of the risks identified above can be handled internally by qualified staff.

- Addresses shall be collected of all property owners that may be affected during the easement maintenance process. *Easement Access Letters* (Appendix A) require delivery to each address with at least 24 hours of notice prior to the start of work.

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For easements located within a *Raster Zone*:

4.6. Easement maintenance sites are determined by:

- Previously submitted inspection work orders and documentation.
- Reports and historical datum such as SSO records and pictures of the suspect easement.
- *Raster Zone* maps. (Appendix B)

4.7. A site inspection shall be performed to confirm the need for maintenance; pictures are to be taken to document the easement condition prior to employing internal/external organizations.

- During the site-inspection, easement condition considerations should include:
 - Potential code enforcement issues,
 - Trees requiring removal,
 - Natural impact requiring environment consulting services.

4.8. The following shall be considered prior to assigning easement maintenance personnel to a project:

- Budgetary restraints,
- Project prioritization and scheduling conflicts,
- Other aspects that can affect the ability to begin or complete a project.


4.9. Addresses shall be obtained for property owners with sewer easements, properties abutting easements, and other parties affected by the sewer maintenance process.

- Special attention should be made for homes that are for-sale from the addresses being collected as there may be an existing encroachment agreement that may need to be renewed.

4.10. As stated in procedure 5.3., code enforcement must determine there is an existing easement.

Once the easement is confirmed, a request for a survey to identify and delineate the easement boundaries shall be made. If an easement does not exist

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Internal surveys are performed by the City of Raleigh Public Works department:

➤ **Current survey contact person:**

Alfonso Felton

alfonso.felton@raleighnc.gov

(919) 996-4118

- 4.11. Once the surveyors have established the easement boundaries, the easement shall be site inspected again to confirm the need for involvement of City of Raleigh personnel and/or contractors.

Code issues that would impede the clearing operation:

- A representative of code enforcement shall be present during the site inspection to identify code violations requiring corrective action.

Trees that are identified for removal:


- The risk factors for determining the need for tree removal specialists include:
 - Tree removal that poses risk of damaging property (i.e. structures, fences, or utilities),
 - Trees exceeding 30' in height or 10" in diameter,
 - Projects with an increased risk to health & safety,
 - A need for specialized skill and/or equipment,
 - Any other factor that would allow the City of Raleigh to be held liable.

Tree(s) requiring removal that do not meet any of the risks identified above can be handled internally by qualified staff.

Projects that will have an environmental impact:

- If a project will impact blue line streams, environmental consultation is required. Any project that requires permitting must fall in one of the *Buffer Zones* described below:
 - Buffer Zone 1 is the area between the top of the embankment of the water body extending 30' away from the water body.
 - Buffer Zone 2 is the area between the edges of Zone 1 extending 20' away from Zone 1.


DEPARTMENTAL OPERATING PROCEDURES

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DOP SM-E-0010, Environmental Permit & Storm Water Projects details the procedures for permitted projects.

- 4.12. *Homeowners Meeting Announcement Letters* (Appendix C) shall be sent by mail, to all addressees to discuss the easement maintenance process. A minimum of 30 days notice of the *homeowners meeting* must be given to the recipients. *Homeowners meetings* require the presence of representatives of code enforcement, sewer easement program, and either the Superintendent or an Assistant Superintendent of Public Utilities Sewer Maintenance Division.
- 4.13. The code enforcement representative shall review any and all code infractions found from the site inspection that would hinder easement maintenance being performed:
 - i. Contact shall be made with the property owner to resolve the code infractions prior to the start of the easement maintenance process. The property owner shall be given 30 days to resolve the issue(s).
 - o If a homeowner wishes to waive the 30-day period and allow City of Raleigh personnel to remove the structure, a *30-Day Waiver/Obstruction Removal Permission Form* (Appendix H) must be obtained.
 - ii. If maintenance personnel must access the property outside of the easement boundary, an *Encroachment Agreement* (Appendix D) must be created between Public Utilities and the property owner prior to the start of the work. This access area needs to be clearly marked by stakes and caution tape, photographed, and detailed in the work order for field personnel.
- 4.14. Confirm that all internal and external organizations understand the scope of the work and approve their involvement in the easement maintenance process.
- 4.15. Upon completion of the above procedures and once code enforcement gives permission to begin work, a work order should be generated to initiate the necessary easement maintenance.
- 4.16. Contact should be made with homeowners in the project that have an existing encroachment agreement to renew the agreement prior to the start of work.
- 4.17. The easement program manager shall be responsible for ensuring that all agreements, waivers, permissions, stipulations, and permitting have been met and finalized prior to the start of work. Once the above have been completed, digital copies shall be stored in a common server drive that work crews may be able to access.
- 4.18. Property owners that are directly impacted by the easement maintenance process

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should be notified by an *Easement Access Letter* (Appendix A) explaining the expected time frame of the maintenance. Property owners not directly affected by the easement maintenance process should be given a *courtesy letter* (Appendix E) explaining the work to be performed in their area. Notices should be delivered in a time frame of a minimum of 24 hours up to one week.

- 4.19. Any property owner wanting or intending to keep the materials left over from the easement maintenance process such as mulch and/or logs shall sign a material acceptance agreement stating such (Appendix F).
- 4.20. For homeowners that wish not to have City of Raleigh provide seed & straw after the clearing operation must sign a *Seed & Straw Waiver* (Appendix G).

Please refer to Appendix I for an example area that can not be cleared and/or receive an herbicide treatment.

DEPARTMENTAL OPERATING PROCEDURES

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City Of Raleigh
North Carolina

Dear Property Owner:

Date: _____

The City of Raleigh Public Utilities Department will be performing routine maintenance and/or repairs to our sanitary sewer infrastructure. This work will take place within our sewer easement, which has been determined to exist across your property. This work may include cutting of trees or other vegetation along our sanitary sewer easement to gain access to perform this work. This work is required to properly maintain and service the sewer lines, manholes, and customer service connections to the Sanitary Sewer System. This work helps to prevent backups and overflows of the sewer system.

We are providing this letter as a courtesy, and to simply inform you of our intent to begin work on _____.

Should you have any questions concerning this matter, please contact one of the gentlemen listed below at 919-250-2737. The encircled name designates the contact person for the work taking place at your location on the date listed above. Thank you for your cooperation in this matter.


- Current Repair Utility Supervisor III
- Current Repair Utility Supervisor I
- Current Repair Utility Supervisor I
- Current Repair Utility Supervisor I
- Current Easement Utility Supervisor III
- Current Easement Utility Supervisor II
- Current Easement Utility Supervisor I
- Current Easement Utility Supervisor I

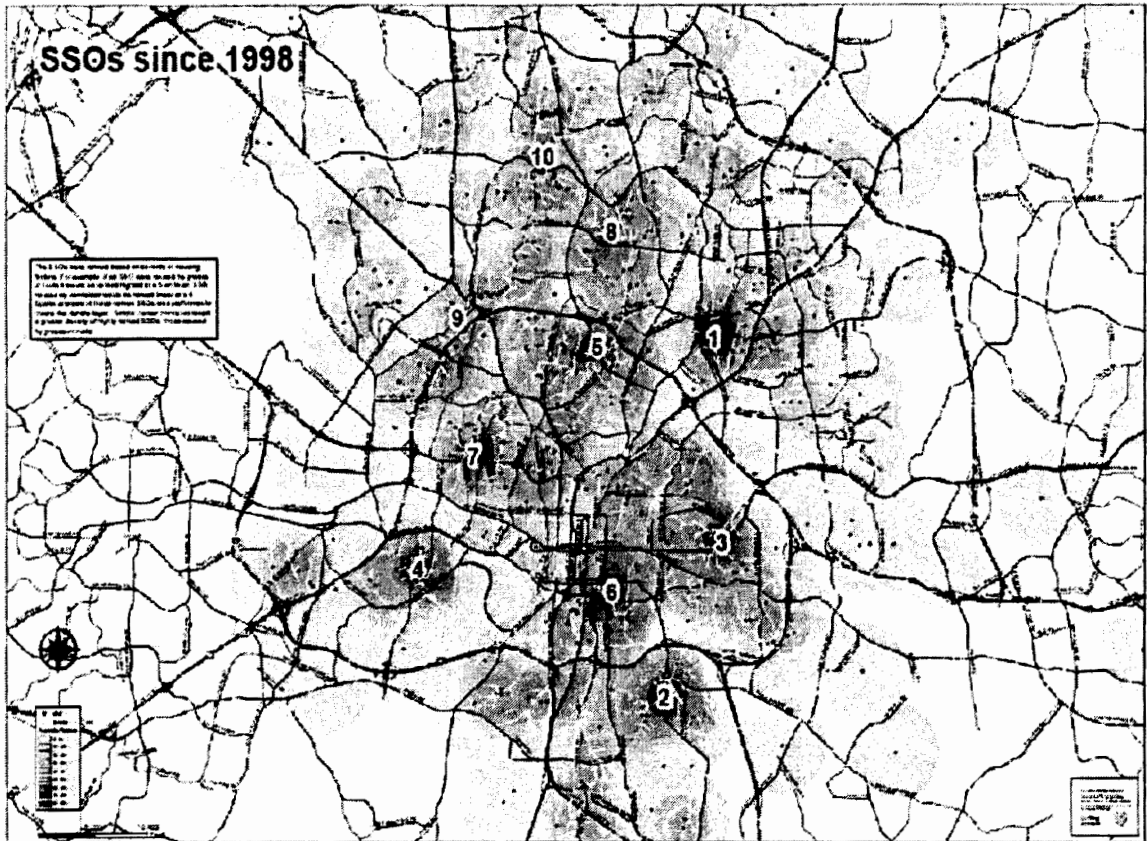
Sincerely,

Current Assistant Superintendent Over Easements
Sewer Maintenance Division
City of Raleigh Public Utilities Department
(919) 250-2737
cc. file

APPENDIX A
Easement Access Letter


DEPARTMENTAL OPERATING PROCEDURES

<p>City of Raleigh, NC</p> 	<p>MANUAL</p> <p>Utility Management System Manual</p>			
<p>SUBJECT Sewer Maintenance; Easement Program</p> <p>Planning for Easement Maintenance</p>	<p>NUMBER EMI-0005</p>	<p>REV 1</p>	<p>EFFECTIVE DATE Sept 2012</p>	<p>PAGE 8 OF 17</p>
	<p>SUPERSEDES</p>	<p>PREPARED BY Easements</p>		<p>Approved by</p>



This map is for example purposes only; *Raster Zones* are updated annually and may migrate over time.

DEPARTMENTAL OPERATING PROCEDURES

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THIS PAGE RESERVED FOR HOMEOWNERS MEETING ANNOUNCEMENT LETTER

DRAFT

DEPARTMENTAL OPERATING PROCEDURES

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City Of Raleigh
North Carolina

Date: _____

Re: Emergency Access Encroachment Agreement

Dear Property Owner:

The City of Raleigh has identified items on your property that are presently located within a City of Raleigh Sewer and/or Water Easement that are preventing emergency access to the City's easement and underlying utility mains.

The City of Raleigh utility crews must have immediate unobstructed access to the easement and associated water and/or sewer main in order to perform emergency repairs and any related sanitary sewer overflow clean-up.


City of Raleigh Code Section 8-2012 states the following:

(c) No person shall plant trees, shrubs, or other plants within a water or sewer easement without prior approval from the Director of the Public Utilities Department.

(d) No person shall place any part of a structure or any permanent equipment within a water or sewer easement without prior written approval from the Director of the Public Utilities Department. Prohibited structures include buildings, houses, decks, garages, tool or storage sheds, swimming pools, wall, and fences. Prohibited equipment includes air conditioning units and heat pumps.

At this time, the City of Raleigh will agree to allow the obstruction(s) to remain at their present location within the City's easement provided that you grant

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the City alternate access to the easement across your property with the following conditions:


1. The City of Raleigh will not be in any way held liable for any damage incurred to your property not limited to but including driveways, sidewalks, lawns, irrigation systems, and landscaping while gaining access to the City's easement and associated utility mains in the agreed upon alternate access area.
2. The City will not repair or replace any sidewalks and/or driveways damaged while gaining access to the above stated easements and utility mains in the agreed upon access area.
3. The City will not replace damaged landscaping or irrigation systems while gaining access in the agreed upon alternate access area.
4. The City will not repair, reseed, or replace sod in any lawns while gaining access in the agreed upon alternate access area.
5. A detailed description of the agreed to alternate access must be included with the Emergency Access Encroachment Agreement (see attached alternate access agreement description form).

If you have any further questions please feel free to contact Code Enforcement Inspector at 919-996- , or by email at @raleighnc.us

Sincerely,

Current Assistant Superintendent Over Easements
Sewer Maintenance Division
City of Raleigh Public Utilities Department
(919) 250-7809
cc. file

DEPARTMENTAL OPERATING PROCEDURES

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City of Raleigh
North Carolina


Alternate Access Area Description

Date _____

Home Owner Signature

City Representative Signature

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City Of Raleigh *North Carolina*

Dear Property Owner:

Date: _____

The City of Raleigh Public Utilities Department will be performing routine maintenance and/or repairs to our sanitary sewer infrastructure in your neighborhood. This work may include cutting of trees or other vegetation along our sanitary sewer easement to gain access to perform this work. This work is required to properly maintain and service the sewer lines, manholes, and customer service connections to the Sanitary Sewer System. This work helps to prevent backups and overflows of the sewer system.

Your property should not be affected by this work. We are providing this letter as a courtesy, and to simply inform you of our intent to begin work within the next several days.


Should you have any questions concerning this matter, please contact one of the gentlemen listed below at 919-250-2737 or via email. Thank you for your cooperation in this matter.

- Current Utilities Supervisor III
- Current Utilities Supervisor II
- Current Utilities Supervisor I
- Current Utilities Supervisor I

Sincerely,

Current Assistant Superintendent Over Easements
Sewer Maintenance Division
City of Raleigh Public Utilities Department
(919) 250-2737
cc. file

DEPARTMENTAL OPERATING PROCEDURES

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City Of Raleigh
North Carolina

August 6, 2010

I, _____, accept full responsibility for the material placed on my property by City of Raleigh personnel. The material consists of tree mulch and logs generated by the removal of trees on the City of Raleigh sanitary sewer easement. I agree to hold the City of Raleigh and its employees harmless from any and all obligations that may arise from or related to the placement of said material on my property.


It is also understood that the material was placed on my property at my request. My signature below signifies my acceptance of the contents of this document.

Property Owner

Address

APPENDIX F
Material Acceptance Agreement

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City Of Raleigh
North Carolina

To:

Name: _____

Address: _____


City, State, Zip: _____

The City of Raleigh, Public Utilities Division's Sewer Maintenance Easement Cutting Crew has requested to put seeding and straw on an easement which is on your property. This letter is to verify that you have denied this service. Please sign below acknowledging that you have denied the City to seed and straw your property.

Signature of Homeowner

Signature of City of Raleigh Employee

DEPARTMENTAL OPERATING PROCEDURES

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City Of Raleigh
North Carolina

My signature below represents my agreement to forego the 30 day time allotted to remove structures from my property that are within the sanitary sewer easement and allow City of Raleigh personnel to remove same. It is understood and mutually agreeable that care will be taken in removing any such items and that the City of Raleigh and its employees will be held harmless from any damage that may occur as a result of their removal.

Chain link or wire fences removed that confine pets can be reinstalled at homeowners' discretion. Reinstallation includes moving outside sanitary sewer easement and rudimentary placement, not including burying posts, fence nor concreting for stability; simply stringing to allow confinement. I also agree that the City and its employees will be held harmless should pets escape as a result of allowing reinstallation of any fencing.


Property Owner Name (PRINT)

Property Owners Name (SIGNATURE)

Address

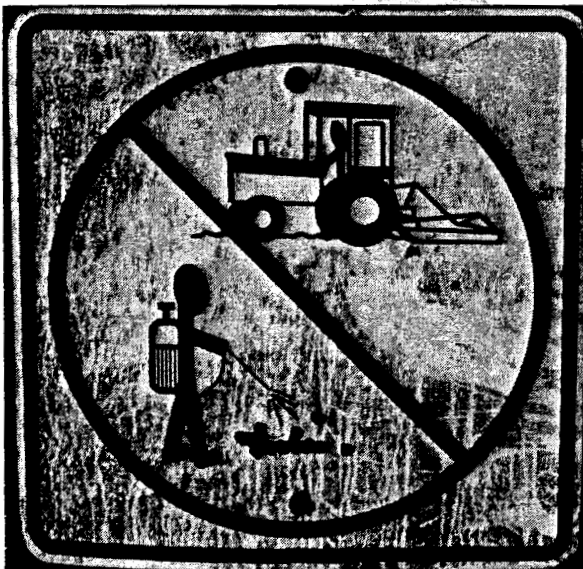
Date

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 		MANUAL Utility Management System Manual		
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Barwell Road (2300-2400 block)
near Britt Drive. Area does not
get herbicide treatment or cutting.



Do Not Cut or Spray Sign
Located at 2300-2400
Block of Barwell Road.

APPENDIX I
Example Area That Does Not Get Cleared

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Grinder	NUMBER EMI-0006	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 1 11
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1.0 **PURPOSE:**

To provide instructions for performing internal easement clearing operations using tractors with grinding capabilities.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Requests & Complaints
- South Raleigh Operations

Water Maintenance Division:

- North Raleigh Operations
- East Raleigh Operations

Administrative Division:

- Code Enforcement

External:

- Customers/Homeowners/Business Owners

3.0 **REFERENCE:**

Departmental Operating Procedure EMI-0010

Departmental Operating Procedure EMI-0012

4.0 **PROCEDURE:**

Easement clearing operations are determined by following GIS basin map books and from work orders generated by City of Raleigh personnel.


Use appropriate PPE for easement clearing operations. Basic PPE includes approved ear protection, gloves, goggles, hard hats with face shields, snake guards, and boots. Additional PPE as required by conditions and situations.

All operations using tractors with grinders for the clearing process must be performed on the easement. The easement should be accessed from public right-of-ways unless encroachment agreements have been met.

***No tractor shall be used in a designated wetland.**

Planning and Preparation

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
	NUMBER EMI-0006 SUPERSEDES	REV 1 PREPARED BY Easements	EFFECTIVE DATE Sept 2012	PAGE OF 2 11 Approved by
SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Grinder				

4.1. Personnel shall perform a site inspection to determine the need of a tractor with grinding capabilities for the clearing operation, easement entry points, and any issue that would prevent the ability to use the tractor appropriately.

- Easement boundaries should be identifiable by such ways as survey markings, flagging, caution tape, or other easily identifiable measures.
- Personnel should be aware of areas that are not to be cut i.e. natural protection areas identified by signs or other areas defined by a supervisor.
- Personnel shall walk the easement to be cleared to identify objects that could damage the grinder such as rocks and debris; the site inspection shall also identify all clean-outs, sewer structures, cables & utilities, and sewer main depths.
- Determine the equipment, tools, and resources needed for the tasks each day to prevent unnecessary trips to the shop. This can include but is not limited to:
 - PPE, insect repellent, water, ice, etc.
 - Fuel for each vehicle and piece of equipment.
 - Items used for maintaining the equipment.

Trees can be removed by City of Raleigh personnel or by contractor.

- Trees that require a contracted specialist include:
 - Tree removal poses risk of damaging property (i.e. structures, fences, utilities, etc.),
 - Trees exceeding 30' in height or 10" in diameter,
 - Projects with an increased risk to health & safety,
 - A need for specialized skill and/or equipment,
 - Other factors that would allow the City of Raleigh to be held liable.


Addresses shall be collected of all property owners that may be affected during the easement maintenance process. *Easement Access Letters* (Appendix A) require delivery to each address with at least 24 hours of notice prior to the start of work.

Tractor with Grinding Capabilities (Appendix B)

4.2. The tractor-grinder is employed when clearing easements with trees having a diameter range of 4-10", heights no greater than 30' and having a linear clearing distance no less than 50 feet. Easements less than 50' shall be hand cut. Trees with diameters greater than 10" or heights greater than 30' are handled by tree removal specialists.

- Use of the tractor-grinder shall comply with all manufacturers' recommendations for care, use, maintenance, and safety.
- Operators of tractor-grinders shall be determined by the Easement Program

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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Manager.

- The tractor-grinder shall be transported to job sites by way of a dump truck hauling a trailer with a maximum load limit no less than 20 tons (40,000 pounds). The tractor-grinder shall be appropriately secured to the trailer using chains, hooks, and binders with at least 4 points of contact between the equipment and the trailer.
- Tractor-grinders shall be greased after every 6 hours of operation. The tractor-grinder shall be inspected for safety issues each day while in operation.
- The tractor-mower shall not pass over buried sewer lines with depths less than 4 feet (to the top of the buried pipe).
- When the grinder is engaged:
 - A minimum distance of 5' shall be kept around sewer structures.
 - When the tractor-grinder is parallel to structures such as homes, a minimum distance of 50' shall be observed while the grinder is engaged.
 - A minimum distance of 250' from the rear of the tractor-grinder to any structure shall be observed while the grinder is engaged.
 - Personnel shall remain 300' away from the grinder while in use.


When sewer structures and/or buildings enter the above mentioned zones, the grinder shall be disengaged until the structure falls outside the zone; these areas shall be hand cut and the materials taken to an area where the tractor-grinder can mulch them safely.

- To complete the clearing, a second pass shall be made with the tractor-grinder to mulch the debris generated from the first pass.
- The tractor-grinder shall be hand cleaned at work site of debris that can fall off during transport; trailer shall be swept of all loose materials prior to transport.

Easement Clearing Finishing Tasks

- 4.3. Alert supervisor if any washouts, sinkholes, and other maintenance issues are discovered during the clearing process.
- 4.4. If during the easement clearing operation an easement is deemed to require restoration see DOP EMI-0012 for site restoration procedures.
 - If a property owner wishes to not have the City of Raleigh provide seed & straw after the clearing operation must sign a Seed & Straw Waiver (Appendix C).

DEPARTMENTAL OPERATING PROCEDURES


City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Grinder	NUMBER EMI-0006 SUPERSEDES	REV 1 PREPARED BY Easements	EFFECTIVE DATE Sept 2012	PAGE 4 OF 11 Approved by

- 4.5. Material debris remaining on the easement after the clearing operation requires exterior disposal, collect the materials and transport to the *COR Yard Waste Recycling Center, 900 N. New Hope Rd.*

Please refer to Appendix D for an example area that can not be cleared and/or receive an herbicide treatment.

DRAFT

DEPARTMENTAL OPERATING PROCEDURES

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City Of Raleigh North Carolina

Dear Property Owner:

Date: _____

The City of Raleigh Public Utilities Department will be performing routine maintenance and/or repairs to our sanitary sewer infrastructure. This work will take place within our sewer easement, which has been determined to exist across your property. This work may include cutting of trees or other vegetation along our sanitary sewer easement to gain access to perform this work. This work is required to properly maintain and service the sewer lines, manholes, and customer service connections to the Sanitary Sewer System. This work helps to prevent backups and overflows of the sewer system.

We are providing this letter as a courtesy, and to simply inform you of our intent to begin work on _____.


Should you have any questions concerning this matter, please contact one of the gentlemen listed below at 919-250-2737. **The encircled name designates the contact person for the work taking place at your location on the date listed above.** Thank you for your cooperation in this matter.

- Current Repair Utility Supervisor III
- Current Repair Utility Supervisor I
- Current Repair Utility Supervisor I
- Current Repair Utility Supervisor I
- Current Easement Utility Supervisor III
- Current Easement Utility Supervisor II
- Current Easement Utility Supervisor I
- Current Easement Utility Supervisor I

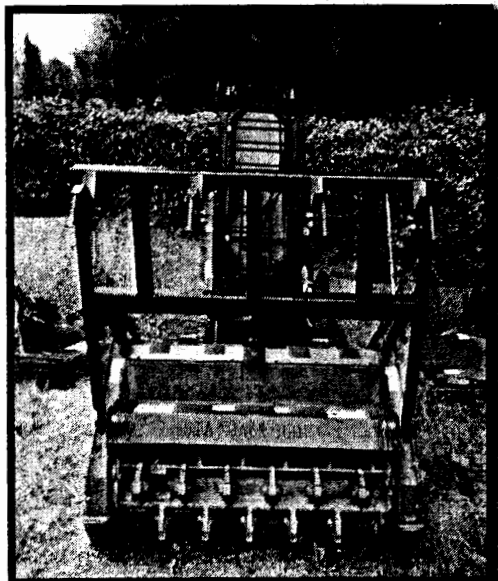
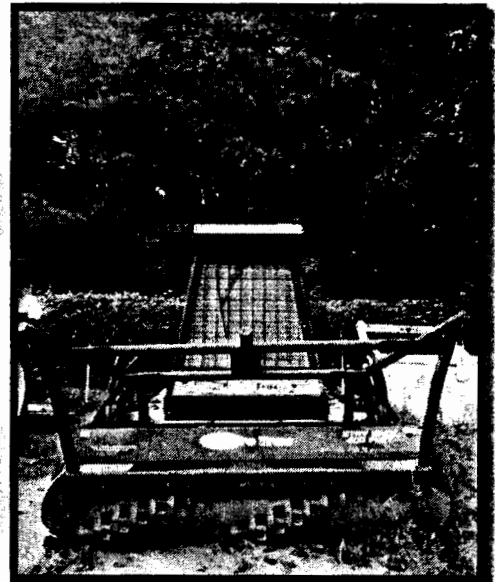
Sincerely,

Current Assistant Superintendent Over Easements
Sewer Maintenance Division
City of Raleigh Public Utilities Department
(919) 250-2737
cc. file


DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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APPENDIX A *Easement Access Letter*



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	SUBJECT Sewer Maintenance; Easement Program	NUMBER EMI-0006	REV 1	EFFECTIVE DATE Sept 2012
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APPENDIX B

Tractor with Grinding Capabilities

DRAFT

DEPARTMENTAL OPERATING PROCEDURES

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	SUPERSEDES	PREPARED BY Easements		Approved by



City Of Raleigh
North Carolina

To:

Name: _____

Address: _____


City, State, Zip: _____

The City of Raleigh, Public Utilities Division's Sewer Maintenance Easement Cutting Crew has requested to put seeding and straw on an easement which is on your property. This letter is to verify that you have denied this service. Please sign below acknowledging that you have denied the City to seed and straw your property.

Signature of Homeowner

Signature of City of Raleigh Employee


DEPARTMENTAL OPERATING PROCEDURES

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APPENDIX C
Seed & Straw Waiver

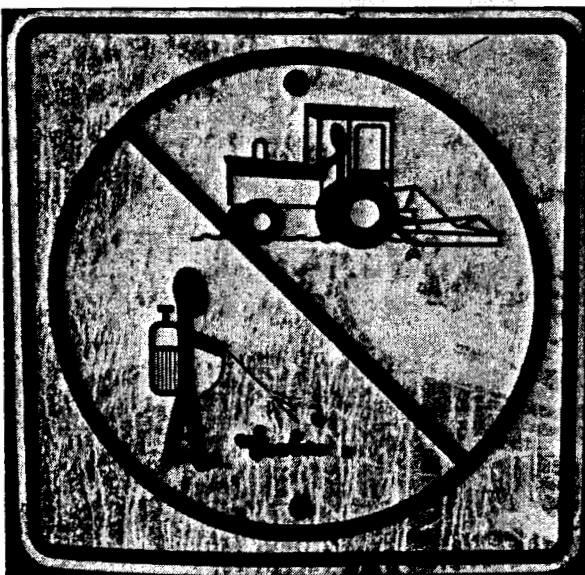
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DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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Barwell Road (2300-2400 block)
near Britt Drive. Area does not
get herbicide treatment or cutting.



Do Not Cut or Spray Sign
Located at 2300-2400
Block of Barwell Road.


DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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APPENDIX D *Example Area That Does Not Get Cleared*

DRAFT

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 		MANUAL Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Mower	NUMBER EMI-0007	REV 1	EFFECTIVE DATE Sept 2012	PAGE 1	OF 11
	SUPERSEDES	PREPARED BY Easements		Approved by	

1.0 **PURPOSE:**

To provide instructions for performing internal easement clearing operations using tractors with mowing equipment.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Requests & Complaints
- South Raleigh Operations

Water Maintenance Division:

- North Raleigh Operations
- East Raleigh Operations

Administrative Division:

- Code Enforcement

External:

- Customers/Homeowners/Business Owners

3.0 **REFERENCE:**

Departmental Operating Procedure EMI-0010

Departmental Operating Procedure EMI-0012

4.0 **PROCEDURE:**

Easement clearing operations are determined by following GIS basin map books and from work orders generated by City of Raleigh personnel.


Use appropriate PPE for easement clearing operations. Basic PPE includes approved ear protection, gloves, goggles, hard hats with face shields, snake guards, and boots. Additional PPE as required by conditions and situations.

All operations using tractors with mowers for the clearing process must be performed on the easement. The easement should be accessed from public right-of-ways unless encroachment agreements have been met.

***No tractor shall be used in a designated wetland.**

Planning and Preparation

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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- 4.1. Personnel shall perform a site inspection to determine the need of a tractor with mowing capabilities for the clearing operation, easement entry points, and any issue that would prevent the ability to use the tractor appropriately.
- Easement boundaries should be identifiable by such ways as survey markings, flagging, caution tape, or other easily identifiable measures.
 - Personnel should be aware of areas that are not to be cut i.e. natural protection areas identified by signs or other areas defined by a supervisor.
 - Personnel shall walk the easement to be cleared to identify objects that could damage the mower such as rocks and debris; the site inspection shall also identify all clean-outs, sewer structures, cables & utilities, and sewer main depths.
 - Determine the equipment, tools, and resources needed for the tasks each day to prevent unnecessary trips to the shop. This can include but is not limited to:
 - PPE, insect repellent, water, ice, etc.
 - Fuel for each vehicle and piece of equipment.
 - Items used for maintaining the equipment.

Trees can be removed by City of Raleigh personnel or by contractor.


- Trees that require a contracted specialist include:
 - Tree removal poses risk of damaging property (i.e. structures, fences, utilities, etc.),
 - Trees exceeding 30' in height or 10" in diameter,
 - Projects with an increased risk to health & safety,
 - A need for specialized skill and/or equipment,
 - Other factors that would allow the City of Raleigh to be held liable.

Addresses shall be collected of all property owners that may be affected during the easement maintenance process. *Easement Access Letters* (Appendix A) require delivery to each address with at least 24 hours of notice prior to the start of work.

Tractor with Mowing and Clearing Capabilities (Appendix B)

- 4.2. The tractor-mower is employed when clearing easements with trees having a diameter range of 2-4", heights no greater than 30' and having a linear clearing distance no less than 50 feet. Easements less than 50' shall be hand cut. Trees with diameters greater than 4" shall be cleared by a tractor-grinder, chain saw, or tree removal specialists. Trees with heights greater than 30' are handled by tree removal specialists.
- Use of the tractor-mower shall comply with all manufacturers' recommendations for care, use, maintenance, and safety.

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Mower	NUMBER EMI-0007	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 3 11
	SUPERSEDES	PREPARED BY Easements		Approved by

- Operators of the tractor-mower shall be determined by the Easement Program Manager.
- The tractor-mower shall be transported to job sites by way of a dump truck hauling a trailer with a maximum load limit no less than 10 tons (20,000 pounds). The tractor-mower shall be appropriately secured to the trailer using chains, hooks, and binders with at least 4 points of contact between the equipment and the trailer.
- Tractor-mowers shall be greased after every 6 hours of operation. The tractor-mower shall be inspected for safety issues each day while in operation
- The tractor-mower shall not pass over buried sewer lines with depths less than 3 feet (to the top of the buried pipe).
- When the mower is engaged:
 - A minimum distance of 5' shall be kept around sewer structures.
 - When the tractor-mower is parallel to structures such as homes, a minimum distance of 50' shall be observed while the mower is engaged.
 - A minimum distance of 100' from the rear of the tractor-mower to any structure shall be observed while the mower is engaged.
 - Personnel shall remain 300' away from the grinder while in use.


When sewer structures and/or buildings enter the above mentioned zones, the mower shall be disengaged until the structure falls outside the zone; these areas shall be hand cut and the materials taken to an area where the tractor-mower can mulch them safely.

- To complete the clearing, a second pass shall be made with the tractor-mower to mulch the debris generated from the first pass.
- The tractor-mower shall be hand cleaned at work site of debris that can fall off during transport; trailer shall be swept of all loose materials prior to transport.

Easement Clearing Finishing Tasks

- 4.3. Alert supervisor if any washouts, sinkholes, and other maintenance issues are discovered during the clearing process.
- 4.4. If the cleared material generated during the clearing operation requires wood chipping see DOP EMI-0010 for wood chipping procedures.
- 4.5. If during the easement clearing operation an easement is deemed to require restoration see DOP EMI-0012 for site restoration procedures.
 - If a property owner wishes to not have the City of Raleigh provide seed &

DEPARTMENTAL OPERATING PROCEDURES

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SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Mower	NUMBER EMI-0007	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 4 11
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straw after the clearing operation must sign a Seed & Straw Waiver (Appendix C).

- 4.6. Material debris remaining on the easement after the clearing operation requires exterior disposal, collect the materials and transport to the *COR Yard Waste Recycling Center, 900 N. New Hope Rd.*

Please refer to Appendix D for an example area that can not be cleared and/or receive an herbicide treatment.

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DEPARTMENTAL OPERATING PROCEDURES

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SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Mower	NUMBER EMI-0007	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 5 11
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City Of Raleigh
North Carolina

Dear Property Owner:

Date: _____

The City of Raleigh Public Utilities Department will be performing routine maintenance and/or repairs to our sanitary sewer infrastructure. This work will take place within our sewer easement, which has been determined to exist across your property. This work may include cutting of trees or other vegetation along our sanitary sewer easement to gain access to perform this work. This work is required to properly maintain and service the sewer lines, manholes, and customer service connections to the Sanitary Sewer System. This work helps to prevent backups and overflows of the sewer system.

We are providing this letter as a courtesy, and to simply inform you of our intent to begin work on _____.


Should you have any questions concerning this matter, please contact one of the gentlemen listed below at 919-250-2737. The encircled name designates the contact person for the work taking place at your location on the date listed above. Thank you for your cooperation in this matter.

- Current Repair Utility Supervisor III
- Current Repair Utility Supervisor I
- Current Repair Utility Supervisor I
- Current Repair Utility Supervisor I
- Current Easement Utility Supervisor III
- Current Easement Utility Supervisor II
- Current Easement Utility Supervisor I
- Current Easement Utility Supervisor I

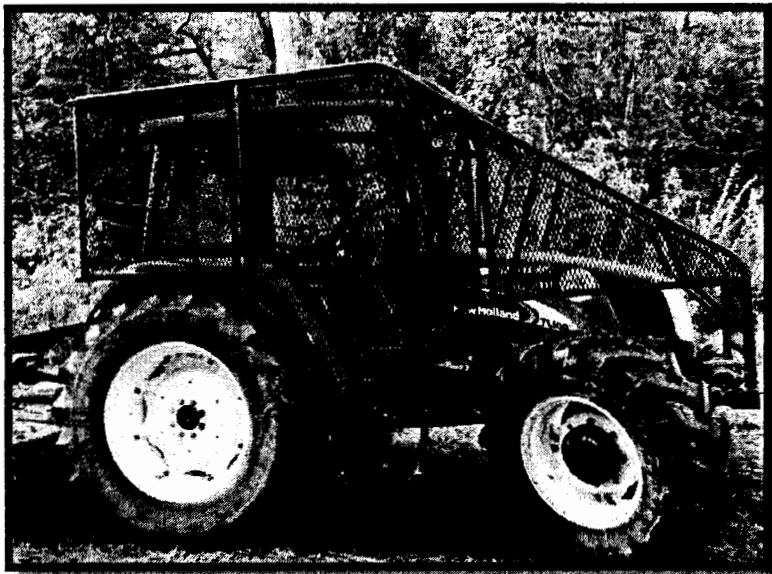
Sincerely,

Current Assistant Superintendent Over Easements
Sewer Maintenance Division
City of Raleigh Public Utilities Department
(919) 250-2737
cc. file


DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Mower	NUMBER EMI-0007	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 6 11
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APPENDIX A *Easement Access Letter*



DEPARTMENTAL OPERATING PROCEDURES


<div>City of Raleigh, NC</div> <div></div>		<div>MANUAL</div> <div>Sewer Maintenance Utility Management System Manual</div>			
<div>SUBJECT</div> <div>Sewer Maintenance; Easement Program</div> <div>Easement Clearing Using a Tractor with Mower</div>	<div>NUMBER</div> <div>EMI-0007</div> <div>SUPERSEDES</div>	<div>REV</div> <div>1</div> <div>PREPARED BY</div> <div>Easements</div>	<div>EFFECTIVE DATE</div> <div>Sept 2012</div>	<div>PAGE OF</div> <div>7</div> <div>11</div> <div>Approved by</div>	

APPENDIX B

Tractor with Mowing Capabilities

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DEPARTMENTAL OPERATING PROCEDURES

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City Of Raleigh
North Carolina

To:

Name: _____

Address: _____


City, State, Zip: _____

The City of Raleigh, Public Utilities Division's Sewer Maintenance Easement Cutting Crew has requested to put seeding and straw on an easement which is on your property. This letter is to verify that you have denied this service. Please sign below acknowledging that you have denied the City to seed and straw your property.

Signature of Homeowner

Signature of City of Raleigh Employee


DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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APPENDIX C
Seed & Straw Waiver

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DEPARTMENTAL OPERATING PROCEDURES

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SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Mower	NUMBER EMI-0007	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 10 11
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Barwell Road (2300-2400 block)
near Britt Drive. Area does not
get herbicide treatment or cutting.



Do Not Cut or Spray Sign
Located at 2300-2400
Block of Barwell Road.

DEPARTMENTAL OPERATING PROCEDURES


City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using a Tractor with Mower	NUMBER EMI-0007	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 11 11
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APPENDIX D

Example Area That Does Not Get Cleared

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DEPARTMENTAL OPERATING PROCEDURES

<div>City of Raleigh, NC</div> <div></div>	<div>MANUAL</div> <div>Sewer Maintenance</div> <div>Utility Management System Manual</div>			
<div>SUBJECT</div> <div>Sewer Maintenance; Easement Program</div> <div>Easement Clearing Using Bush Trimmers</div>	<div>NUMBER</div> <div>EMI-0008</div>	<div>REV</div> <div>1</div>	<div>EFFECTIVE DATE</div> <div>Sept 2012</div>	<div>PAGE OF</div> <div>1 10</div>
	<div>SUPERSEDES</div>	<div>PREPARED BY</div> <div>Easements</div>		<div>Approved by</div>

1.0 PURPOSE:

To provide instructions for performing internal easement clearing operations using bush trimmers.

2.0 ORGANIZATIONS AFFECTED:

Internal:

Sewer Maintenance Division:

- Requests & Complaints
- South Raleigh operations

Water Maintenance Division:

- North Raleigh Operations
- East Raleigh Operations

Administrative Division:

- Code Enforcement

External:

- Customers/Homeowners/Business Owners

3.0 REFERENCE:

Departmental Operating Procedure EMI-0010

Departmental Operating Procedure EMI-0012

4.0 PROCEDURE:

Easement clearing operations are determined by following GIS basin map books and from work orders generated by City of Raleigh personnel.


Use appropriate PPE for easement clearing operations. Basic PPE includes approved ear protection, gloves, goggles, hard hats with face shields, snake guards, and boots. Additional PPE as required by conditions and situations.

All operations using bush trimmers for the clearing process must be performed on the easement. The easement should be accessed from public right-of-ways unless encroachment agreements have been met.

Planning and Preparation

- 4.1. Personnel shall perform a site inspection to determine the need of bush trimmers for the clearing operation, easement entry points, and any issue that would prevent the

DEPARTMENTAL OPERATING PROCEDURES

<p>City of Raleigh, NC</p> 	<p>MANUAL</p> <p>Sewer Maintenance</p> <p>Utility Management System Manual</p>			
<p>SUBJECT</p> <p>Sewer Maintenance; Easement Program</p> <p>Easement Clearing Using Bush Trimmers</p>	<p>NUMBER</p> <p>EMI-0008</p>	<p>REV</p> <p>1</p>	<p>EFFECTIVE DATE</p> <p>Sept 2012</p>	<p>PAGE OF</p> <p>2 10</p>
	<p>SUPERSEDES</p>	<p>PREPARED BY</p> <p>Easements</p>		<p>Approved by</p>

ability to use the bush trimmers appropriately.

- Easement boundaries should be identifiable by such ways as survey markings, flagging, caution tape, or other easily identifiable measures.
- Personnel should be aware of areas that are not to be cut i.e. natural protection areas identified by signs or other areas defined by a supervisor.
- Determine the equipment, tools, and resources needed for the tasks each day to prevent unnecessary trips to the shop. This can include but is not limited to:
 - PPE, insect repellant, water, ice, etc.
 - Fuel for each vehicle and piece of equipment.
 - Items used to maintain equipment such as files for sharpening the blades or string for the bush trimmers.


Addresses shall be collected of all property owners that may be affected during the easement maintenance process. *Easement Access Letters* (Appendix A) require delivery to each address with at least 24 hours of notice prior to the start of work.

Bush Trimmers with Saw Blade (Appendix C)

4.2. The bush trimmers equipped with saw blades are employed when clearing easements with trees having diameters less than 2" and heights no greater than 30'. Trees with diameters greater than 2" shall be cleared by tractor-mower, tractor-grinder, or tree removal specialists. Trees with heights greater than 30' are handled by tree removal specialists.

- Trees that require a contracted specialist include:
 - Tree removal poses risk of damaging property (i.e. structures, fences, utilities, etc.),
 - Trees exceeding 30' in height or 10" in diameter,
 - Projects with an increased risk to health & safety,
 - A need for specialized skill and/or equipment,
 - Other factors that would allow the City of Raleigh to be held liable.
- Use of bush trimmers shall comply with all manufacturers' recommendations for care, use, maintenance, and safety.
- Use of bush trimmers shall comply with all manufacturers' recommendations for care, use, maintenance, and safety.
- Do not use bush trimmers equipped with saw blades around utilities, sewer structures, or private property that may be damaged by the blades.
- Bush trimmers equipped with saw blades can be used up to the horizontal level of the operator's shoulder. Any height greater than this, a pole saw shall be employed (Appendix B).
- The bush trimmers shall be cleaned and maintained each day including but

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City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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not limited to, cleaning filters, oil/gas ratios, and blade sharpening with file.

Bush Trimmers with String (Appendix C)

4.3. The bush trimmers equipped with string are employed when clearing brush, undergrowth, and grasses.


- Use of bush trimmers shall comply with all manufacturers' recommendations for care, use, maintenance, and safety.
- Use bush trimmer equipped with string no greater than 105-line (0.105 inch thickness) to clear around sewer structures.
- The bush trimmers shall be cleaned and maintained each day including but not limited to, cleaning filters, oil/gas ratios, etc.

Easement Clearing Finishing Tasks

- 4.4. Alert supervisor if any washouts, sinkholes, and other maintenance issues are discovered during the clearing process.
- 4.5. If the cleared material generated during the clearing operation requires wood chipping see DOP EMI-0010 for wood chipping procedures.
- 4.6. Material debris remaining on the easement after the clearing operation requires exterior disposal, collect the materials and transport to the *COR Yard Waste Recycling Center, 900 N. New Hope Rd.*

Please refer to Appendix D for an example area that can not be cleared and/or receive an herbicide treatment.

DEPARTMENTAL OPERATING PROCEDURES

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City Of Raleigh
North Carolina

Dear Property Owner:

Date: _____

The City of Raleigh Public Utilities Department will be performing routine maintenance and/or repairs to our sanitary sewer infrastructure. This work will take place within our sewer easement, which has been determined to exist across your property. This work may include cutting of trees or other vegetation along our sanitary sewer easement to gain access to perform this work. This work is required to properly maintain and service the sewer lines, manholes, and customer service connections to the Sanitary Sewer System. This work helps to prevent backups and overflows of the sewer system.

We are providing this letter as a courtesy, and to simply inform you of our intent to begin work on _____.


Should you have any questions concerning this matter, please contact one of the gentlemen listed below at 919-250-2737. **The encircled name designates the contact person for the work taking place at your location on the date listed above.** Thank you for your cooperation in this matter.

- Current Repair Utility Supervisor III
- Current Repair Utility Supervisor I
- Current Repair Utility Supervisor I
- Current Repair Utility Supervisor I
- Current Easement Utility Supervisor III
- Current Easement Utility Supervisor II
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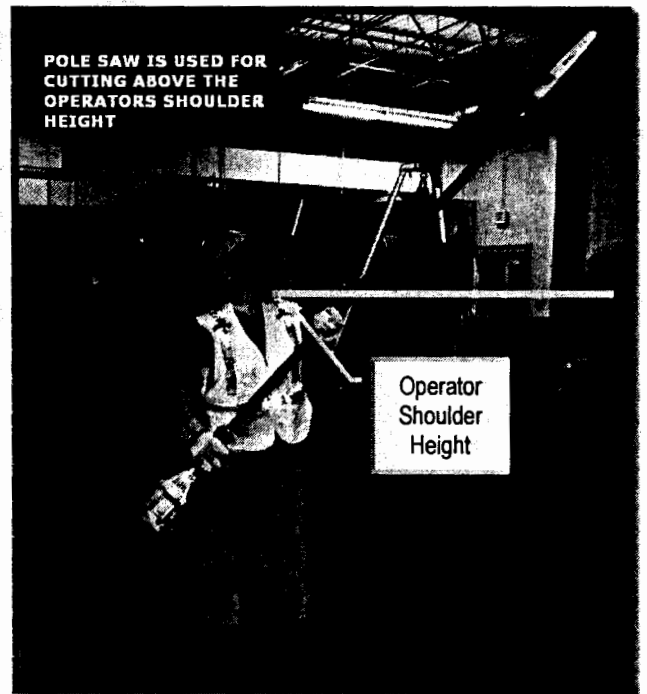
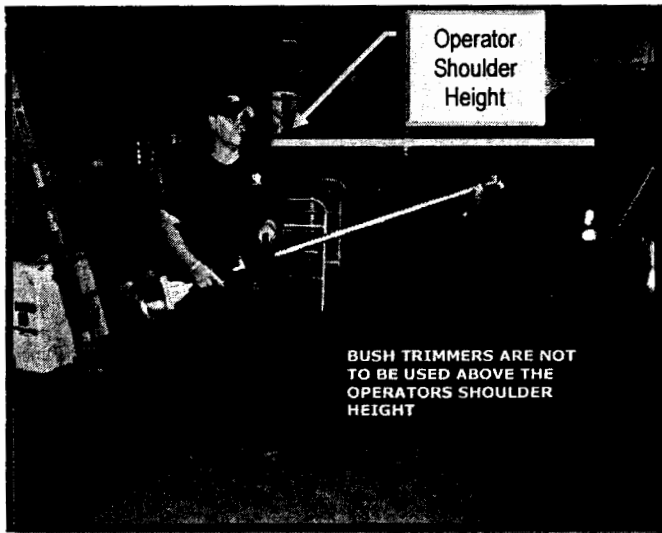
Sincerely,

Current Assistant Superintendent Over Easements
Sewer Maintenance Division
City of Raleigh Public Utilities Department
(919) 250-2737
cc. file


DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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APPENDIX A *Easement Access Letter*



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APPENDIX B

Height for Using a Bush Trimmer versus a Pole Saw

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DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC



MANUAL

Sewer Maintenance

Utility Management System Manual

SUBJECT

Sewer Maintenance; Easement Program

Easement Clearing Using Bush Trimmers

NUMBER

EMI-0008

REV

1

EFFECTIVE DATE

Sept 2012

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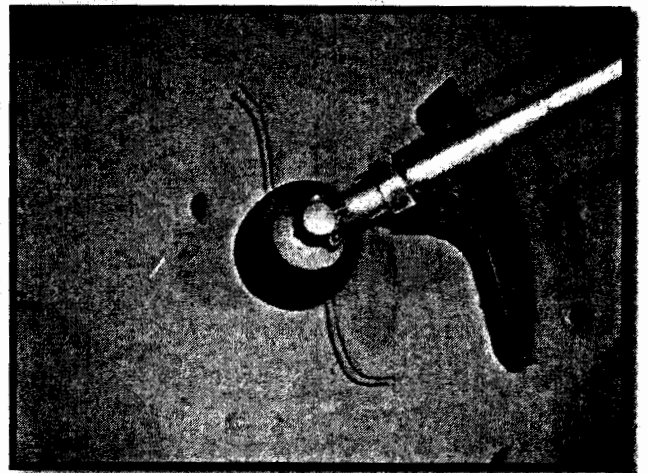
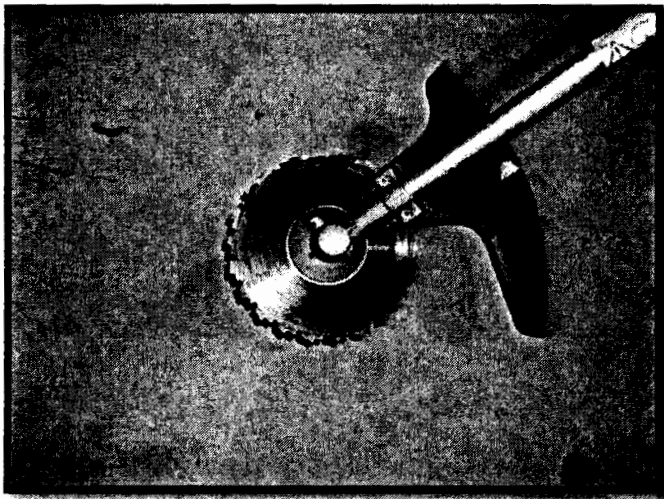
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SUPERSEDES


PREPARED BY

Easements

Approved by




DEPARTMENTAL OPERATING PROCEDURES

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Bush Trimmers with Saw Blade & String

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Barwell Road (2300-2400 block)
near Britt Drive. Area does not
get herbicide treatment or cutting.



Do Not Cut or Spray Sign
Located at 2300-2400
Block of Barwell Road.

DEPARTMENTAL OPERATING PROCEDURES


City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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APPENDIX D

Example Area That Does Not Get Cleared

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DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
	SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using Chain or Pole Saws	NUMBER EMI-0009	REV 1	EFFECTIVE DATE Sept 2012
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		SUPERSEDES	PREPARED BY Easements	Approved by

1.0 **PURPOSE:**

To provide instructions for performing internal easement clearing operations using chain or pole saws.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- ~~Requests & Complaints?~~
- South Raleigh Operations

Water Maintenance Division:

- North Raleigh Operations
- East Raleigh Operations

Administrative Division:

- Code Enforcement

External:

- Customers/Homeowners/Business Owners

3.0 **REFERENCE:**

Departmental Operating Procedure EMI-0010 Wood Chipping Procedures

Departmental Operating Procedure EMI-0012 Add title of DOP

Reference to COR safety program and Manufacturers Manual.

4.0 **PROCEDURE:** (Any handheld apparatus)


Easement clearing operations are determined by following GIS basin map books and from work orders generated by City of Raleigh personnel.

Use appropriate PPE for easement clearing operations. Basic PPE includes approved hearing protection, gloves, goggles, hard hats with face shields, chain saw chaps, and boots. Additional PPE as required by conditions and situations.

All operations using chain or pole saws for the clearing process must be performed on the easement. The easement should be accessed from public right-of-ways unless encroachment agreements have been met.

All operators of chain or pole saws shall receive annual training on chain saw use & safety prior to operating the saws.

DEPARTMENTAL OPERATING PROCEDURES

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Planning and Preparation

- 4.1. Personnel shall perform a site inspection to determine the need of chain or pole saws for the clearing operation, easement entry points, and any issue that would prevent the ability to use the saws appropriately.
- Easement boundaries should be identifiable by such ways as survey markings, flagging, caution tape, or other easily identifiable measures.
 - Personnel should be aware of areas that are not to be cut i.e. natural protection areas identified by signs or other areas defined by a supervisor.
 - Determine the equipment, tools, and resources needed for the tasks each day to prevent unnecessary trips to the shop. This can include but is not limited to:
 - PPE, insect repellent, water, ice, etc.
 - Fuel for each vehicle and piece of equipment.
 - Items used to maintain equipment such as files for sharpening the cutters.

Trees can be removed by City of Raleigh personnel or by contractor.


- Trees that require a contracted specialist include:
 - Tree removal poses risk of damaging property (i.e. structures, fences, utilities, etc.),
 - Trees exceeding 30' in height or 10" in diameter,
 - Projects with an increased risk to health & safety,
 - A need for specialized skill and/or equipment,
 - Other factors that would allow the City of Raleigh to be held liable.

Addresses shall be collected of all property owners that may be affected during the easement maintenance process. *Easement Access Letters* (Appendix A) require delivery to each address with at least 24 hours of notice prior to the start of work.

Chain Saws and Pole Saws

- 4.2. Chain saws and pole saws are employed when clearing easements of trees having a diameter range of 4-10" and heights no greater than 30'. Trees with diameters greater than 10" or heights greater than 30' are handled by tree removal specialists. (Covered above)
- Use of chain saws and pole saws shall comply with all manufacturers' recommendations for care, use, maintenance, and safety.
 - All applicable PPE including chain saw chaps must be used at all times that chain or pole saws are in use. (List of required PPE)
 - Any sewer structure within a tree's fell zone requires supervisor approval

DEPARTMENTAL OPERATING PROCEDURES

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before felling.


- Chain saws can be used up to the horizontal level of the operator's shoulder. Any height greater than this, a pole saw shall be employed (Appendix B)
- The chain saws and pole saws shall be cleaned and maintained at minimum each day, and as needed including but not limited to, cleaning filters, oil/gas ratios, and sharpening of blades with appropriate files.

Easement Clearing Finishing Tasks

- 4.3. Alert supervisor if any washouts, sinkholes, and other maintenance issues are discovered during the clearing process.
- 4.4. If the cleared material generated during the clearing operation requires wood chipping see DOP EMI-0010 for wood chipping procedures.
- 4.5. If during the easement clearing operation an easement is deemed to require restoration see DOP EMI-0012 for site restoration procedures.
 - If a property owner wishes to not have the City of Raleigh provide seed & straw after the clearing operation property owner must sign a Seed & Straw Waiver (Appendix C).
- 4.6. Material debris remaining on the easement after the clearing operation requires exterior disposal, collect the materials and transport to the *COR Yard Waste Recycling Center, 900 N. New Hope Rd.* (refer to the Gyro DOP)

Please refer to Appendix D for an example area that can not be cleared and/or receive an herbicide treatment.

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL			
	Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using Chain or Pole Saws	NUMBER EMI-0009	REV 1	EFFECTIVE DATE Sept 2012	PAGE OF 4 10
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City Of Raleigh
North Carolina

Dear Property Owner:

Date: _____

The City of Raleigh Public Utilities Department will be performing routine maintenance and/or repairs to our sanitary sewer infrastructure. This work will take place within our sewer easement, which has been determined to exist across your property. This work may include cutting of trees or other vegetation along our sanitary sewer easement to gain access to perform this work. This work is required to properly maintain and service the sewer lines, manholes, and customer service connections to the Sanitary Sewer System. This work helps to prevent backups and overflows of the sewer system.

We are providing this letter as a courtesy, and to simply inform you of our intent to begin work on _____.


Should you have any questions concerning this matter, please contact one of the gentlemen listed below at 919-250-2737. The encircled name designates the contact person for the work taking place at your location on the date listed above. Thank you for your cooperation in this matter.

- Current Repair Utility Supervisor III
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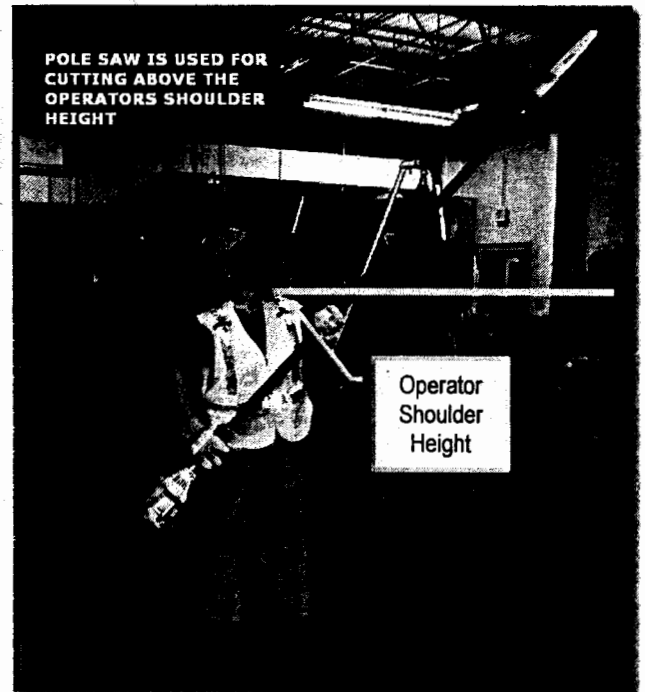
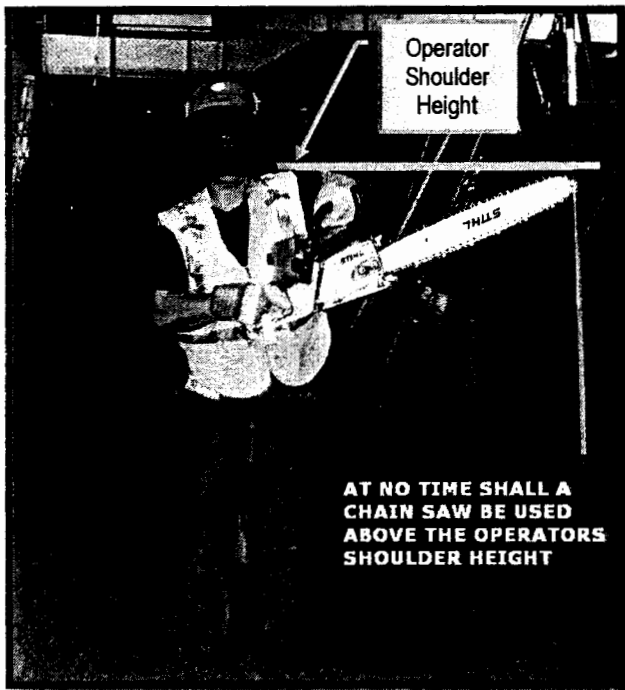
Sincerely,

Current Assistant Superintendent Over Easements
Sewer Maintenance Division
City of Raleigh Public Utilities Department
(919) 250-2737
cc. file


DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
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SUBJECT Sewer Maintenance; Easement Program Easement Clearing Using Chain or Pole Saws				

Easement Access Letter



DEPARTMENTAL OPERATING PROCEDURES


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APPENDIX B

Height for Using a Chain Saw Versus a Pole Saw

DRAFT

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City Of Raleigh
North Carolina

To:

Name: _____

Address: _____


City, State, Zip: _____

The City of Raleigh, Public Utilities Division's Sewer Maintenance Easement Cutting Crew has requested to put seeding and straw on an easement which is on your property. This letter is to verify that you have denied this service. Please sign below acknowledging that you have denied the City to seed and straw your property.

Signature of Homeowner

Signature of City of Raleigh Employee


DEPARTMENTAL OPERATING PROCEDURES

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APPENDIX C Seed & Straw Waiver

DRAFT

DEPARTMENTAL OPERATING PROCEDURES

<div><p>City of Raleigh, NC</p></div> <div></div>	<div><p>MANUAL</p></div> <div><h2>Sewer Maintenance Utility Management System Manual</h2></div>			
	<div><p>SUBJECT</p></div> <div><p>Sewer Maintenance; Easement Program</p></div> <div><p>Easement Clearing Using Chain or Pole Saws</p></div>	<div><p>NUMBER</p></div> <div><p>EMI-0009</p></div>	<div><p>REV</p></div> <div><p>1</p></div>	<div><p>EFFECTIVE DATE</p></div> <div><p>Sept 2012</p></div>
<div><p>SUPERSEDES</p></div>	<div><p>PREPARED BY</p></div> <div><p>Easements</p></div>		<div><p>Approved by</p></div>	




Barwell Road (2300-2400 block)
near Britt Drive. Area does not
get herbicide treatment or cutting.



Do Not Cut or Spray Sign
Located at 2300-2400
Block of Barwell Road.

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APPENDIX D

Example Area That Does Not Get Cleared

DRAFT

DEPARTMENTAL OPERATING PROCEDURES

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	SUBJECT Sewer Maintenance; Easement Program Wood Chipping Equipment	NUMBER EMI-0010 SUPERSEDES	REV 1 PREPARED BY Easements	EFFECTIVE DATE Sept 2012 APPROVED BY PAGE 1 OF 1

1.0 PURPOSE:

To outline the protocol for using wood chipping equipment.

2.0 ORGANIZATIONS AFFECTED:

Sewer Maintenance


3.0 REFERENCE:

4.0 DEFINITIONS:

5.0 PROCEDURE:

- 5.1. Establish area for chipper in safe location to perform chipping operation. What are primary hazards for chipping operations?
- 5.2. Create zones for pedestrian and vehicle traffic control (flagging as needed). Follow PU-DOP for signage, traffic control, and safety.
- 5.3. Create a 50' radius boundary around the wood chipper to allow for blow-back and flying debris.
- 5.4. Apply wood not exceeding 8" in diameter. For chippers without auto-feed, adjust feed rate as necessary to avoid stalling or binding.

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1.0 **PURPOSE:**

To provide instructions for the proper protocol for the application of herbicides to sanitary sewer easements.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Requests & Complaints (formerly Cutting)

External:

- Customers/Homeowners/Business Owners

3.0 **REFERENCE:**

4.0 **DEFINITIONS:**

Herbicide: Chemical agent used to destroy or inhibit plant growth.

PPE: Personal protective equipment that is used by staff for protection from expected work hazards. PPE is issued by the City of Raleigh and is expected to be used while working.


SDS: Acronym for safety data sheet. SDS are intended to provide workers and emergency personnel with procedures for handling or working with the substance in a safe manner. SDS includes further information such as physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first-aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures.

Sewer structure: Any part of the sanitary sewer system as a whole. This includes pipe, manholes, and pump stations to name a few.

5.0 **PROCEDURE:**


- 5.1. Use appropriate PPE for the application of herbicides. Basic PPE includes approved protective coveralls (i.e. Tyvek®), gloves, goggles, hard hats with face shields, and boots. Additional PPE as required by conditions and situations.
- 5.2. Chemical agent(s) used in the process of the herbicide treatment require a MSDS from the manufacturer; MSDS(s) must be present with personnel at all times the chemical agents are in their possession.

DEPARTMENTAL OPERATING PROCEDURES

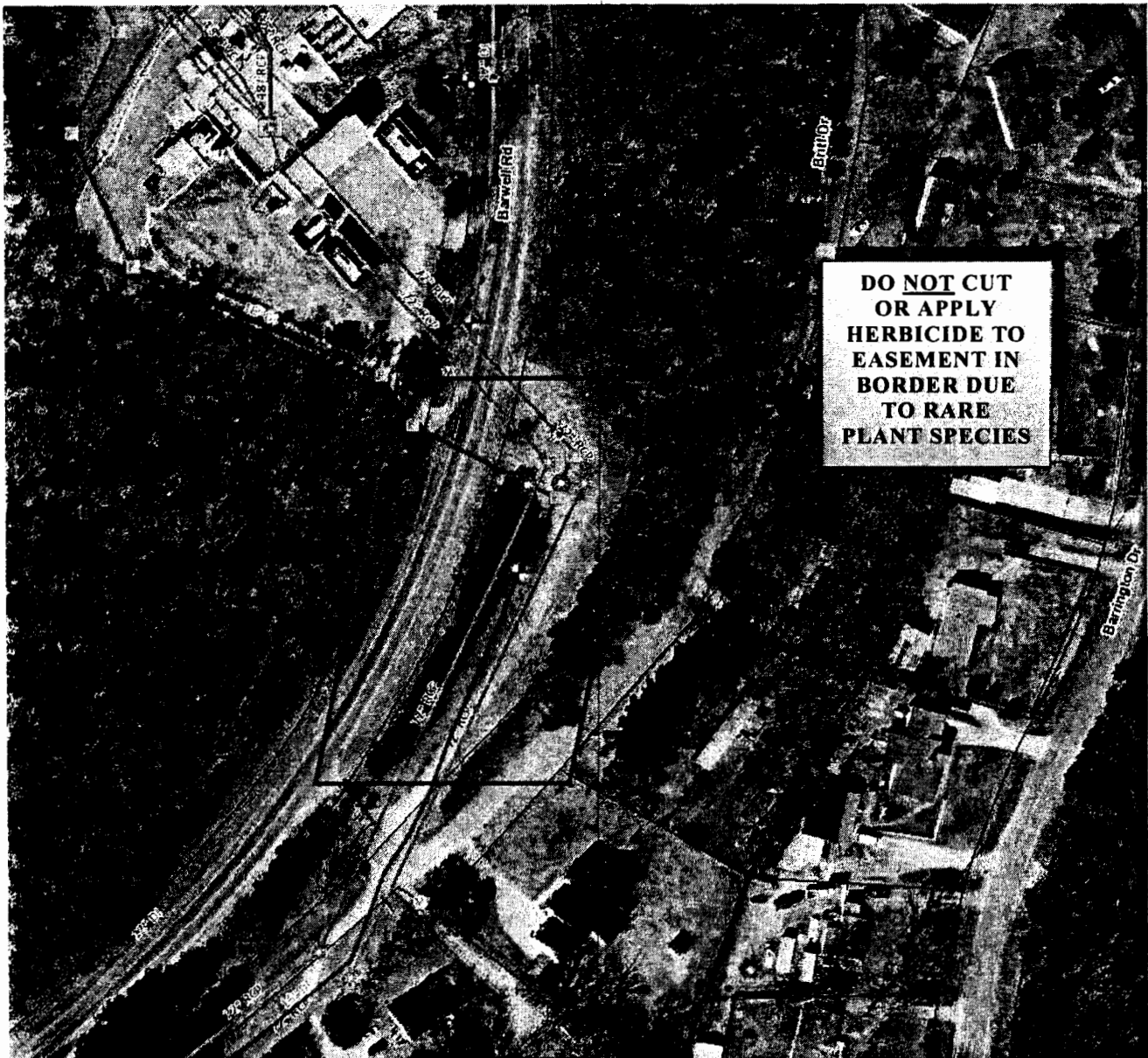
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- 5.3. Herbicide application must be performed by or under the direct supervision of a "Pesticide Applicator" certified through the Department of Agriculture.
- 5.4. Applying herbicides can be affected by weather. Ideal weather conditions includes:
 - Dry conditions.
 - Calm to non-existent wind speeds.
 - Zero predicted precipitation for 48 hours following the treatment.
- 5.5. Site inspections should be conducted prior to applying herbicides to identify pathways to bodies of water the chemicals may take and any other health & safety issues. Considerations concerning the treatment include:
 - Proximity to residential structures.
 - Site should be at least 50' from rivers, creeks, streams, or other bodies of water.
 - Site should be at least 10' from drainage areas (engineered or natural) to prevent transport of chemicals to water bodies.
 - Slope and elevation issues that would assist in the transference of chemicals to water bodies.
- 5.6. For diluting chemical concentrations, follow manufacturer's directions for appropriate chemical to water ratios. Diluting of chemicals is performed at the location of the herbicide treatment. If undiluted chemicals are spilled on ground, area should be saturated with water to dilute the chemical.
- 5.7. When using a tractor for spreading herbicide, sewer structures should be avoided and the areas around the structures should be treated with the back pack hand sprayer.
- 5.8. Do not apply herbicides to areas that restrict cutting and/or herbicide treatment of vegetation. Do not apply herbicides to areas that are the responsibility of City of Raleigh Parks & Recreation, North Carolina Department of Transportation, or other governing agency. Do not apply herbicides to areas outside of sanitary sewer easements.
- 5.9. In the event of chemicals entering waterways, contact supervisor responsible for herbicide treatments to follow up with the North Carolina Department of Agriculture.


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2300-2400 Block of Barwell Road – Street Guide Map Page 137-P



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SUBJECT
Sewer Maintenance; Easement Program

Herbicide Application

Do Not Cut or Spray Sign Located at 2300-2400 Block of Barwell Road



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MONSANTO COMPANY

Safety Data Sheet
Commercial Product

1. PRODUCT AND COMPANY IDENTIFICATION

Product name
Roundup PowerMAX® Herbicide

EPA Reg. No.
524-549

Chemical name
Not applicable.

Synonyms
None.

Company
MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167
Telephone: 800-332-3111, Fax: 314-694-5557
E-mail: safety.datasheet@monsanto.com

Emergency numbers

FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).

FOR MEDICAL EMERGENCY - Day or Night: +1 (314) 694-4000 (collect calls accepted).

2. HAZARDS IDENTIFICATION

Emergency overview

Appearance and odour (colour/form/odour): Pale amber - Pale brown / Liquid / Odourless

CAUTION!
CAUSES MODERATE EYE IRRITATION

Potential health effects

Likely routes of exposure

Skin contact, eye contact, inhalation

Eye contact, short term

May cause temporary eye irritation.

Skin contact, short term

Not expected to produce significant adverse effects when recommended use instructions are followed.

Inhalation, short term

Not expected to produce significant adverse effects when recommended use instructions are followed.

Refer to section 11 for toxicological and section 12 for environmental information.

OSHA Status

This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.


3. COMPOSITION/INFORMATION ON INGREDIENTS

Active ingredient

Potassium salt of N-(phosphonomethyl)glycine; (Potassium salt of glyphosate)

Composition

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COMPONENT	CAS No.	% by weight (approximate)
Potassium salt of glyphosate	70901-12-1	48.7
Other ingredients		51.3

The specific chemical identity is being withheld because it is trade secret information of Monsanto Company.

4. FIRST AID MEASURES

Use personal protection recommended in section 8.

Eye contact

If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.

Skin contact

Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Inhalation

If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

Ingestion

Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison center or doctor. Do not give anything by mouth to an unconscious person.

Advice to doctors

This product is not an inhibitor of cholinesterase.

Antidote

Treatment with atropine and oximes is not indicated.

5. FIRE-FIGHTING MEASURES

Flash point

Does not flash.

Extinguishing media

Recommended: Water, foam, dry chemical, carbon dioxide (CO2)

Unusual fire and explosion hazards

Minimise use of water to prevent environmental contamination.
Environmental precautions: see section 6.

Hazardous products of combustion

Carbon monoxide (CO), phosphorus oxides (P_xO_y), nitrogen oxides (NO_x)


Fire fighting equipment

Self-contained breathing apparatus.
Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

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Use personal protection recommended in section 8.

Environmental precautions

Minimise spread.
Contain spillage with sand bags or other means.
Keep out of drains, sewers, ditches and water ways.

Methods for cleaning up

SMALL QUANTITIES:
Flush spill area with water.
LARGE QUANTITIES:
Absorb in earth, sand or absorbent material.
Dig up heavily contaminated soil.
Collect in containers for disposal.
Refer to section 7 for types of containers.
Flush residues with small quantities of water.
Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.
Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

Handling

Avoid contact with eyes, skin and clothing.
When using do not eat, drink or smoke.
Wash hands thoroughly after handling or contact.
Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
Thoroughly clean equipment after use.
Refer to section 13 of the safety data sheet for disposal of rinse water.
Wash contaminated clothing before re-use.
Emptied containers retain vapour and product residue.
FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

Storage


Minimum storage temperature: -15 °C
Maximum storage temperature: 50 °C
Compatible materials for storage: stainless steel, fibreglass, plastic, glass lining
Incompatible materials for storage: galvanised steel, unlined mild steel, see section 10.
Keep out of reach of children.
Keep away from food, drink and animal feed.
Keep only in the original container.
Partial crystallization may occur on prolonged storage below the minimum storage temperature.
If frozen, place in warm room and shake frequently to put back into solution.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne exposure limits

Components	Exposure Guidelines
Potassium salt of glyphosate	No specific occupational exposure limit has been established.
Other ingredients	No specific occupational exposure limit has been established.

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Engineering controls
No special requirement when used as recommended.

Eye protection
If there is significant potential for contact:
Wear chemical goggles.

Skin protection
Wear chemical resistant gloves.
If there is significant potential for contact:
Wear face shield.
Wear chemical resistant clothing/footwear.
Applicators and other handlers must wear:
Wear long sleeved shirt, long pants and shoes with socks.
Follow manufacturer's instructions for cleaning/maintaining Personal Protective Equipment.
If no such instructions for washables, use detergent and hot water.

Respiratory protection
No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.


Colour/colour range:	Pale amber - Pale brown
Odour:	Odourless
Form:	Liquid
Physical form changes (melting, boiling, etc.):	
Melting point:	No data.
Boiling point:	No data.
Flash point:	Does not flash.
Explosive properties:	No data.
Auto ignition temperature:	No data.
Specific gravity:	1.3565 @ 20 °C / 15.6 °C
Vapour pressure:	No significant volatility; aqueous solution.
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	Not applicable.
Kinematic viscosity:	No data.
Density:	1.3365 g/cm3 @ 20 °C
Solubility:	Water: Completely miscible.
pH:	4.3 - 4.8
Partition coefficient:	log Pow: -3.2 @ 25 °C (glyphosate)

10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions of handling and storage.

Oxidizing properties

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No data.

Materials to avoid/Reactivity

Reacts with galvanized steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

Hazardous decomposition

Thermal decomposition: Hazardous products of combustion: see section 5.

Self-accelerating decomposition temperature (SADT)

No data.

11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Data obtained on similar products and on components are summarized below.

Similar formulation

Acute oral toxicity

Rat, LD50: > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.

Acute dermal toxicity

Rat, LD50: > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.

Acute inhalation toxicity

Rat, LC50, 4 hours, aerosol:
Practically non-toxic.
FIFRA category IV.

No 4-hr LC50 at the maximum tested concentration. For purposes of the inhalation test, product was artificially aerosolized. Since this material will not become aerosolized to a hazardous concentration during transport, it is classified as non-hazardous under the transportation regulations in accordance with 2.6.2.2.4.7(b) and (c) of the UN Recommendations on the Transport of Dangerous Goods.

Skin sensitization

Guinea pig, 3-induction Buehler test:
Positive incidence: 0 %

Similar formulation

Skin irritation

Rabbit, 3 animals, OECD 404 test:
Days to heal: 7
Primary Irritation Index (PII): 1.9/8.0
Slight irritation.
FIFRA category IV.


Eye irritation

Rabbit, 3 animals, OECD 405 test:
Days to heal: 10
Moderate irritation.
FIFRA category III.

N-(phosphonomethyl)phosphonic acid; FIFRA category III.

Mutagenicity

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In vitro and in vivo mutagenicity test(s):

Not mutagenic.

Repeated dose toxicity

Rabbit, dermal, 21 days:

NOAEL toxicity: > 5,000 mg/kg body weight/day

Target organs/systems: none

Other effects: none

Rat, oral, 3 months:

NOAEL toxicity: > 20,000 mg/kg diet

Target organs/systems: none

Other effects: none

Chronic effects/carcinogenicity

Mouse, oral, 24 months:

NOAEL toxicity: ~ 5,000 mg/kg diet

Target organs/systems: liver

Other effects: decrease of body weight gain, histopathologic effects

NOEL tumour: > 30,000 mg/kg diet

Tumours: none

Rat, oral, 24 months:

NOAEL toxicity: ~ 8,000 mg/kg diet

Target organs/systems: eyes

Other effects: decrease of body weight gain, histopathologic effects

NOEL tumour: > 20,000 mg/kg diet

Tumours: none

Toxicity to reproduction/fertility

Rat, oral, 2 generations:

NOAEL toxicity: 10,000 mg/kg diet

NOAEL reproduction: > 30,000 mg/kg diet

Target organs/systems in parents: none

Other effects in parents: decrease of body weight gain

Target organs/systems in pups: none

Other effects in pups: decrease of body weight gain

Effects on offspring only observed with maternal toxicity.

Developmental toxicity/teratogenicity

Rat, oral, 6 - 19 days of gestation:

NOAEL toxicity: 1,000 mg/kg body weight

NOAEL development: 1,000 mg/kg body weight

Other effects in mother animal: decrease of body weight gain, decrease of survival

Developmental effects: weight loss, post-implantation loss, delayed ossification

Effects on offspring only observed with maternal toxicity.

Rabbit, oral, 6 - 27 days of gestation:

NOAEL toxicity: 175 mg/kg body weight

NOAEL development: 175 mg/kg body weight

Target organs/systems in mother animal: none

Other effects in mother animal: decrease of survival

Developmental effects: none

12. ECOLOGICAL INFORMATION


This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on similar products and on components are summarized below.

Similar formulation

Aquatic toxicity, fish

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Bluegill sunfish (*Lepomis macrochirus*):
 Acute toxicity, 96 hours, static, LC50: 5.2 mg/L
 Moderately toxic.

Common carp (*Cyprinus carpio*):
 Acute toxicity, 96 hours, static, LC50: 4.0 mg/L
 Moderately toxic.

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):
 Acute toxicity, 48 hours, static, EC50: 8.0 mg/L
 Moderately toxic.

Similar formulation

Aquatic toxicity, algae/aquatic plants

Green algae (*Selenastrum capricornutum*):
 Acute toxicity, 72 hours, static, EC50: 0.46 mg/L
 Highly toxic.

Arthropod toxicity

Honey bee (*Apis mellifera*):
 Oral, 48 hours, LD50: > 281 µg/bee
 Practically non-toxic.

Honey bee (*Apis mellifera*):
 Contact, 48 hours, LD50: > 273 µg/bee
 Practically non-toxic.

Soil organism toxicity, invertebrates

Earthworm (*Eisenia fetida*):
 Acute toxicity, 14 days, LC50: > 10,000 mg/kg dry soil
 Practically non-toxic.

Soil organism toxicity, microorganisms

Nitrogen and carbon transformation test:
 29.5 kg/ha, 28 days: Less than 25% effect on nitrogen or carbon transformation processes in soil.

N-(phosphonamethyl)glycine; 1-glyphosate

Avian toxicity

Bobwhite quail (*Colinus virginianus*):
 Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
 No more than slightly toxic.

Mallard duck (*Anas platyrhynchos*):
 Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
 No more than slightly toxic.

Bobwhite quail (*Colinus virginianus*):
 Acute oral toxicity, single dose, LD50: > 3,851 mg/kg body weight
 Practically non-toxic.

Bioaccumulation

Bluegill sunfish (*Lepomis macrochirus*):
 Whole fish: BCF: < 1
 No significant bioaccumulation is expected.


Dissipation

Soil, field:
 Half life: 2 - 174 days
 Koc: 834 - 60,000 L/kg
 Adsorbs strongly to soil.

Water, aerobic:
 Half life: < 7 days

13. DISPOSAL CONSIDERATIONS

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Product

Keep out of drains, sewers, ditches and water ways.
Recycle if appropriate facilities/equipment available.
Burn in proper incinerator.
Follow all local/regional/national/international regulations.

Container

See the individual container label for disposal information.
Emptied containers retain vapour and product residue.
Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.
Empty packaging completely.
Triple or pressure rinse empty containers.
Do NOT contaminate water when disposing of rinse waters.
Ensure packaging cannot be reused.
Do NOT re-use containers.
Store for collection by approved waste disposal service.
Recycle if appropriate facilities/equipment available.
Follow all local/regional/national/international regulations.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

This product is not hazardous under the applicable DOT, ICAO/IATA, or IMDG regulations.

15. REGULATORY INFORMATION

TSCA Inventory
Exempt

OSHA Hazardous Components
Surfactant(s)


SARA Title III Rules
Section 311/312 Hazard Categories
Immediate
Section 302 Extremely Hazardous Substances
Not applicable.
Section 313 Toxic Chemical(s)
Not applicable.

CERCLA Reportable quantity
Not applicable.

16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.
Follow all local/regional/national/international regulations.
Please consult supplier if further information is needed.
In this document the British spelling was applied.
|| Significant changes versus previous edition.

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC 	MANUAL Sewer Maintenance Utility Management System Manual			
	SUBJECT Sewer Maintenance; Easement Program Herbicide Application	NUMBER EMI-0011 SUPERSEDES	REV 1 PREPARED BY Easements	EFFECTIVE DATE Sept 2012

MONSANTO COMPANY
Roundup PowerMAX® Herbicide

Version: 4.0

Page: 9 / 9
Effective date: 05/06/2011

NFPA Health Flammability Instability Additional Markings
 0 = Minimal hazard, 1 = Slight hazard, 2 = Moderate hazard, 3 = Severe hazard, 4 = Extreme hazard

Full denomination of most frequently used acronyms: BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MRL (Maximum Exposure Limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PI (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)


This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, MONSANTO Company or any of its subsidiaries makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for the purposes prior to use. In no event will MONSANTO Company or any of its subsidiaries be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR TO THE PRODUCT TO WHICH INFORMATION REFERS.

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End of document

DEPARTMENTAL OPERATING PROCEDURES

City of Raleigh, NC		 MANUAL Sewer Maintenance Utility Management System Manual			
SUBJECT Sewer Maintenance Post-Maintenance Site Restoration	NUMBER EMI-0012	REV 1	EFFECTIVE DATE Sept 2012	PAGE 1	OF 7
	SUPERSEDES	PREPARED BY Easements		Approved by	

1.0 **PURPOSE:**

To provide instructions for the restoration of land surfaces following maintenance & construction operations.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Repairs
- Flushing & Maintenance
- CCTV
- Requests & Complaints
- South Raleigh Operations

Water Maintenance Division:

- North Raleigh Operations
- East Raleigh Operations

External:

- Customers/Homeowners/Business Owners

3.0 **REFERENCE:**

Departmental Operating Procedure EMI-0007

4.0 **PROCEDURE:**

Use appropriate PPE for site restoration projects. Basic PPE includes approved vest, goggles, gloves, and boots. Additional PPE as required by conditions and situations may be required.


All operations using a tractor & straw blower (Appendix A), service vehicle, or heavy equipment for site restoration must be performed on the easement. The easement should be accessed from public right-of-ways unless encroachment agreements have been met.

For operations using a straw blower, a minimum 3 person crew is required to operate:

- The vehicle/tractor towing the straw blower,
- The straw blower guide,
- The straw feeder.

Straw blower transportation requires a heavy-duty service vehicle with 4x4 capabilities and a minimum towing capacity of 2500 pounds.

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Use of a tractor shall follow the same procedures outlined in DOP EMI-0007.


No tractor shall be used in a designated wetland.

Planning and Preparation

4.1. Site inspections shall be performed prior to beginning restoration projects to determine:

- The quantity of top soil, seed, and straw needed.
 - Quantity of top soil required for the site restoration process is determined by a cubic measurement (length x width x depth).
 - Quantity of seed and straw required for the site restoration process is determined by a square measurement (length x width).
- The need for a tractor with a straw blower for the site restoration operation, easement entry points, and any issue that would prevent the ability to use the tractor appropriately.
 - Considerations for using a tractor include:
 - ◆ Issue that would prevent using a heavy-duty service truck such as maneuverability and traction issues.
 - Considerations for using a straw blower include:
 - ◆ Practicality of time & labor,
 - ◆ Length of easement,
 - ◆ Elevation changes such as creeks, drainage, embankments, etc. that would prevent the transport of the straw blower.
 - Easement boundaries should be identifiable by such ways as survey markings, flagging, caution tape, or other easily identifiable measures.
 - The site inspection shall also identify all clean-outs, sewer structures, cables & utilities, and sewer main depths.
- The need for heavy equipment to compact the top soil fill:
 - Considerations for using heavy equipment include:
 - ◆ Fill depths exceeding 2" that would allow settling or the formation of a concave surface.
 - ◆ Fill areas with a radial width exceeding 1.5 feet.
- The equipment, tools, and resources needed for the tasks each day to prevent unnecessary trips to the shop. This can include but is not limited to:
 - PPE, insect repellent, water, ice, etc.
 - Fuel for each vehicle and piece of equipment.
 - Items used for maintaining the equipment.
 - The required volume of top soil and area of seed & straw.

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- 4.2. If a property owner wishes to not have the City of Raleigh provide seed & straw after the clearing operation must sign a Seed & Straw Waiver (Appendix B).


Site Restoration

- 4.3. Apply top soil to fill ruts, gouges, and other voids in the desired land surface.
- For filled surfaces less than 2" in depth and not exceeding a radial length of 1.5 feet can be compacted and graded using manual methods such as shovels and rakes.
 - For the surface areas greater than 2" in depth and exceeding a radial length of 1.5 feet the above stated shall be compacted and initially graded using heavy equipment such as excavators.
 - Final grading of the top soil shall be performed using hand rakes to remove all imperfections.
- 4.4. Apply grass seed and straw to the compacted & graded land surface.
- To manually spread seed and straw:
 - Space out bales of straw at intervals that would allow for an appropriate amount of straw to cover the seed and top soil for that portion of easement,
 - Uniformly spread grass seeds by hand tossing the seeds over the top soil.
 - Hand-toss the straw, evenly distributing it over the seed and top soil.

The straw blower is employed to uniformly and efficiently disperse grass seed and straw. Use of the straw blower shall comply with all manufacturers' recommendations for care, use, maintenance, and safety. The straw blower has moving parts and personnel shall exercise caution while feeding straw into the blower.

- To use the straw blower to spread seed and straw:
 - Grass seed is emptied into the hopper,
 - Straw shall be dry and unspoiled,
 - String must be removed from the bales prior to being added into the straw feeder,
 - The straw shall be broken up into manageable sizes prior to being added into the straw feeder,
 - The blower guide shall be operated in a manner that will evenly distribute the seed and straw,
 - All grass seed in the hopper shall be spread prior to leaving the

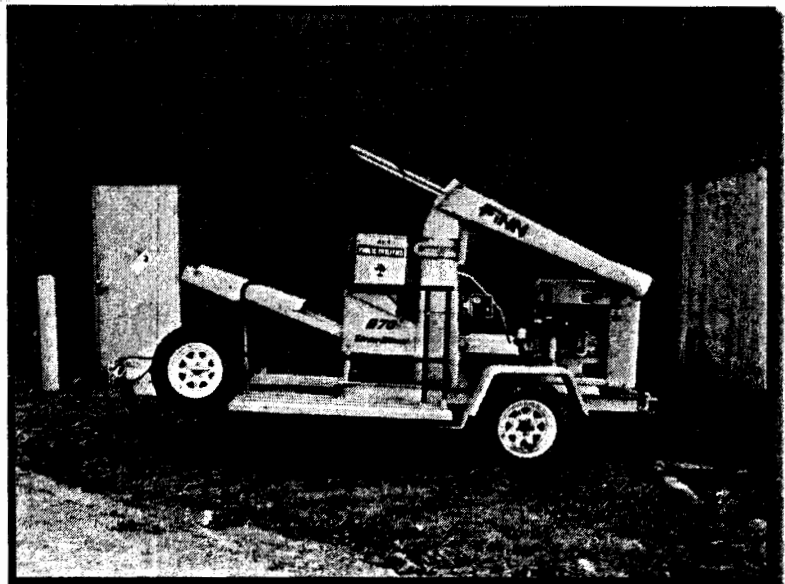
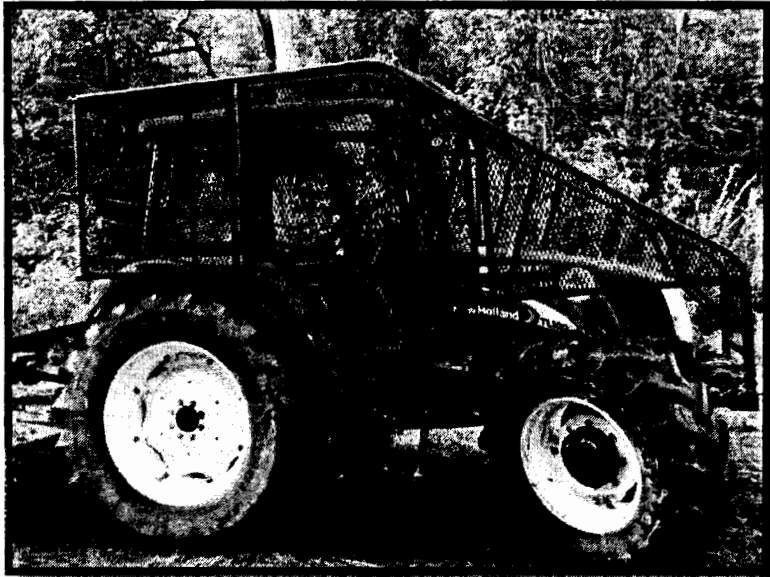
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easement.

Finishing Tasks

- 4.5. Alert supervisor if any washouts, sinkholes, and other maintenance issues are discovered during the clearing process.




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APPENDIX A
Tractor & Straw Blower

DRAFT

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City Of Raleigh
North Carolina

To:

Name: _____

Address: _____


City, State, Zip: _____

The City of Raleigh, Public Utilities Division's Sewer Maintenance Easement Cutting Crew has requested to put seeding and straw on an easement which is on your property. This letter is to verify that you have denied this service. Please sign below acknowledging that you have denied the City to seed and straw your property.

Signature of Homeowner

Signature of City of Raleigh Employee


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APPENDIX B
Seed & Straw Waiver

DRAFT

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1.0 **PURPOSE:**

To detail the procedures involved in environmental permitting & storm water projects from discovery to completion.

2.0 **ORGANIZATIONS AFFECTED:**

Internal:

Sewer Maintenance Division:

- Repairs
- South Raleigh Operations

Water Distribution Division:

- North Raleigh Operations
- East Raleigh Operations

External:

- Customers/Homeowners/Business Owners
- Tree Removal Contractor
- NCDENR; DWQ
- EPA
- Division of Land Resources
- US Army Corps of Engineers
- Environmental Consultants

3.0 **REFERENCE:**


Black's Law Dictionary, Third Edition, 2006
Wetlands, Streams, Buffers, and Sanitary Sewer Maintenance Regulatory Requirements,
Training Module, 2009; Dewberry®
Operation and Maintenance of Wastewater Collection Systems: Volume 1: 6th Ed
Departmental Operating Procedure SM-E-0002
Departmental Operating Procedure SM-E-0003

4.0 **DEFINITIONS:**

Aerial: Within the sewer maintenance division this term is associated with any length of pipe that is exposed thus posing a higher risk of damage or failure. This includes pipes aerially spanning creeks, washed out pipe, submerged pipe, or pipe encased in concrete (above surface).

Blue line: A line on a map denoting the location of a *stream* (see below) demonstrated in blue.

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Buffer zones: The area extending away from a *blue-line stream* embankment 50' that req
Collections system: A network of pipes, manholes, cleanouts, traps, siphons, lift stations, and other structures used to collect all wastewater and wastewater-carried wastes of an area and transport them to a treatment plant or disposal system. The collection system includes land, wastewater lines and appurtenances, pumping stations and general property.

Easement: Legal right to use the property of others for a specific purpose.

Easement entry points: The location of which a *right-of-way* connects to an established sewer *easement* or private property.

GIS basin maps: Sectional maps of Wake County watersheds; these maps are created internally by Geographic Information Systems (GIS) staff. The maps detail information regarding sewer lines such as structure type, location, size, material, active status, flow directions, and configuration. Also depicted are building footprints, road locations, and other information for reference purposes for field personnel.

Impact: Of a *wetland or stream*; any activity that results in the excavation or fill of material (soil, rock, sediment, plant material, debris, etc.) into a stream or wetland. Of a *buffer zone*; disturbance in the natural cover that may cause or contribute to sedimentation.

Intermittent streams:

Perennial streams:

Right-of-way: The right to pass through property owned by another. A right-of-way may be established by contract, by longstanding usage, or by public authority (as with a highway). The use of the term *right-of-way* in this document is specifically for streets.

Riparian: Of, relating to, or located on the bank of a river or stream.

Sewer structure: Any individual part of the *collection system*.

SSMH: Sanitary sewer manhole.


Streams: All other surface waters not specified by *wetlands* (see below) including: intermittent streams, perennial streams, lakes, and ponds. Generally these are indicated as *blue-lines* (see above) on the most recent United States Geologic Survey (USGS) 7.5 minute quadrangle map.

Wetlands: Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

5.0 PROCEDURE:

5.1. During the inspections process outlined in DOP SM-E-0002 & SM-E-0003, easements and sewer structures that potentially require permitting due to environmental impact will be addressed by way of work order, GIS basin map notation, and photograph. Impact can include:

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- Maintenance and repair of sanitary sewer lines and manholes.
- Stream bank stabilization.
- The creation of access roads.
- Clearing of the access corridor.
- Selective cutting and maintaining of the access corridor.

- 5.2. The documentation generated from the inspection will then be sent to the responsible City of Raleigh employee designated (designee) by the Easement Maintenance Manager. The designee will be the liaison with the environmental consultants; all aspects of the permitting process, specifically in regards to the consultants, shall be managed directly by the designee.
- 5.3. The designee will assign the documentation a numerical tracking number that will allow for monthly consultant invoice reconciliation.
- 5.4. The designee will forward the project to the current environmental consultants for determination if the project falls within a blue line stream requiring permitting.
- 5.5. Prior to staging the project, a repair group supervisor or designated surrogate will take pictures of the entire project limits. The pictures shall include:
- Each homeowner's yard adjacent to the easement.
 - The area requiring construction/repair.
 - The easement access point(s).
- 5.6. Once permit is issued all parameters and guidelines issued shall be respected. If the scope of the project exceeds the parameters of the permit, then NCDENR (or do we notify Dewberry?) must be notified and a new permit application may be required.
- 5.7. If the total fills for the project exceed one acre or 150 linear feet of stream, compensatory mitigation may be required.
- 5.8. The project shall be supervised by employees specifically trained in *Wetlands, Streams, Buffers, and Sanitary Sewer Maintenance Regulatory Requirements* training.
- 5.9. The project repair shall not allow for:
- Black liner to show from under the riprap
 - Riprap or excavator teeth marks in the stream.

The project repair shall have:


- Riprap embedded in the bank.

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- Riprap with a thickness greater than 2 feet.
- 5.10. Prior to removing equipment from the project, the designee will site inspect the project to confirm that the standards set forth in procedure 5.10 have been followed.
- The designee shall determine that the work is satisfactory and shall approve the removal of equipment from the project.
- 5.11. The project area shall be restored using measures such as applying seed & straw.
- 5.12. A repair group supervisor or designated surrogate shall take pictures of the entire project limits. The pictures shall include:
- Each homeowner's yard adjacent to the easement.
 - The area requiring construction/repair.
 - The easement access point(s).
- These pictures shall be sent to the designee to close out the project.
- 5.13. The designee will notify the environmental consultants that the work has been completed

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SUBJECT Sewer Maintenance Flushing	NUMBER SM-0001	REV 1	EFFECTIVE DATE Month year	PAGE OF 1 4
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1.0 Purpose:

The purpose is to provide instructions for the proper operation of Combo Vac Flush Truck and cleaning of Sanitary Sewer Mains.

Standardization to ensure all sewer cleaning operations are done uniformly across the different operation centers.

2.0 History

3.0 Organizations Affected:

Raleigh Sewer Operations
South Raleigh Sewer Operations
North Raleigh Sewer Operations
East Raleigh Sewer Operations

4.0 Reference:

Vac All Operators Manual
Manual for Uniform Traffic Control Devices (MUTCD)
North Carolina Department of Transportation (NCDOT) Guidelines
DOP XXX (temporary traffic control devices)

5.0 Definitions/Tooling:

Cleaning Nozzle-Warthog or Equivalent (GET PICTURES OF EACH)
Root Saw or Turbo Saw
Footage: Linear feet from manhole to manhole on one pass, regardless of the number of passes required to clean lines.


6.0 Procedure:

6.1 Upon arrival to the job site, proper warning signs must be placed to alert traffic of the work zone.

6.2 Once flush truck is in position, traffic cones will be placed around work area for safety.

6.3 All PPE will be worn. This includes: face shield and goggles, safety vest, hearing protection, hard hat and gloves.

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6.4 Before opening the manhole, the gas monitor will be placed at the top of the manhole for atmospheric testing prior to opening. If there are no holes in the top of the manhole, the top will be partially opened (2-3 inches) and the hose will be placed in the top for testing.

6.5 Once manhole is opened, the operator will place safety rails around the manhole opening and test atmospheric conditions in the manhole, starting from the top and working to the bottom of the manhole, this is to make sure no hazardous conditions exists; if conditions exists, the line will be purged using gas or electric air blower in the upstream manhole until no hazardous atmospheric conditions exists.

6.6 Operator will lower nozzle into the manhole invert going upstream, unless conditions prevent flushing upstream. If conditions prevent flushing upstream, the nozzle will be placed going downstream.

6.7 All Concrete, VCP pipe will be flushed using a root saw or turbo saw.

6.7-A All PVC, ductile iron pipe will be cleaned using a warthog or equivalent cleaning nozzle unless roots or grease are present, then the root saw will be required.

6.8 Operator will send nozzle or cutter upstream at no greater than 2000 PSI to help prevent back blow into Homes and pump damage, unless conditions exist that prevent flushing this way, then the line can be flushed backwards. At no time will pump pressure exceed 2000 PSI.


6.8-A Operator will wear face shield when nozzle is sent up line until there is a possibility that no longer exists for Debris to blow out of manhole then the operator can lift face shield until line hose is brought back.

6.9 Sewer spoon or catch basket will be used in down stream manhole to catch debris coming down line and debris will be removed using vacuum or placed in a bucket and taken to dumping pads for disposal.

6.9-A Dumping pads are located at the dead end of Old Williams Road, located off Quarry Ridge Lane.

6.9-B NOTE: Vehicles are not to access Old Williams Road at Rock Quarry Road.

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<div style="display: flex; justify-content: space-between; align-items: center;"> <div>City of Raleigh, NC</div>  </div>	MANUAL Sewer Maintenance Utility Management System Manual			
<small>SUBJECT</small> Sewer Maintenance <div style="text-align: center;">Flushing</div>	<small>NUMBER</small> SM-0001 <small>SUPERSEDES</small>	<small>REV</small> 1 <small>PREPARED BY</small>	<small>EFFECTIVE DATE</small> Month year	<small>PAGE OF</small> 3 4 <small>Approved by</small>

6.9-C When pulling hose to flush an easement, a manhole roller will be used on manhole to help prevent wearing of flush hose.

6.10 Manhole will continuously be monitored by the gas monitor while operation is ongoing.


6.10-A Assistant will go to the next manhole, up or down stream, carrying at least 2 traffic cones and wait to notify operator when nozzles arrives at manhole. This step will be repeated for every manhole the nozzle is sent to.

6.10-B If manhole is in the street, assistant will place the 2 traffic cones around the manhole being checked and employee will stay within the cone perimeter.

6.11 The following information will be recorded on each work order created for each job:


- 6.11-A** Address where work is being performed.
- 6.11-B** Size of line
- 6.11-C** Type of pipe, ie. Plastic, ductile iron, concrete, clay.
- 6.11-D** Type and depth of Manhole, ie. Concrete, brick, stone.
- 6.11-E** Map Page and letter from street index guide, ie. 124-E.
- 6.11-F** Type of debris found, ie. Roots, grease, debris.
- 6.11-G** Amount of debris removed, ie. Light medium, heavy.
- 6.11-H** Date and start and stop times.
- 6.11-I** Gas monitors readings.
- 6.11-J** If work was a PM or a call.
- 6.11-K** If line flushed due to a call, list if the problem was City or Homeowner. If it was the City, list the cause.
- 6.11-L** Record if line was cleaned with nozzle or root saw.
- 6.11-M** Record direction cleaned and if it was in street, beside or behind property.
- 6.11-N** Record all equipment, crew member names, straight or overtime.
- 6.11-O** All items received from warehouse will be placed on work order, including: inventory I.D. number, item name, amount received and truck received to and the warehouse ticket will be turned in with work order.
- 6.11-P** Total flushing footage from manhole to manhole in one pass for each segment of line flushed.
- 6.11-Q** Number of passes to clean line if needed: this will be put in comments section of work order.

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- 6.12** If grease is present in line, the line will be cleaned using a root saw then flushed using Bison 300.
- 6.13** Each time flush truck is moved to a new location, a new work order for the address will be generated with the new information.
- 6.14** When responding to a call, if the resident is there, make contact before starting to verify the problem and let them know what you are going to do. Contact them when you are finished, advising them of your findings. If no one is at the residence, leave a door hanger, notifying of the findings.
- 6.15** No sewer service will be flushed unless directed by a Supervisor and if directed, the service shall be televised to see if broken. If service is not broken, the homeowner may be billed. The homeowner is responsible for blockages from the building to the main, going to the street and for all repairs if service goes to an easement. We flush only mains. If service is broken under street and we verify this, the City will fix it at no charge to the resident.
- 6.16** Once job is completed, all tools, traffic cones and warning signs will be picked up before crew leaves site to go to the next work area, then all steps will be repeated.
- 6.17** If flush hose or nozzle gets hung up in the line, the crew will immediately notify the Supervisor. The Supervisor will notify the repair crew immediately to be on standby while crew tries to dislodge hose.
- 6.18** Supervisor may contact CCTV Supervisor if hose cannot be freed to have CCTV crew televise line in attempt to locate where the nozzle or hose is hung up and this will be given to repair crew to show location of excavation.

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1.0 **PURPOSE:**

To provide protection to the citizens of Raleigh, and its merger Towns and to guard all land, surface, and ground waters by ensuring a managed response and corrective action to all discharges from the wastewater collection system.

2.0 **SCOPE:**


This Guideline shall apply to all Department employees that are or may be assigned to work related to the response, containment, and mitigation of collection system based sanitary sewer overflows (SSO's) within the City of Raleigh Public Utilities Department service area as mandated by the North Carolina Department of Environment and Natural Resources (DENR) Division of Water Quality (DWQ) permit # WQCS00002. The Operator in Responsible Charge (ORC) or an appointed Back-up ORC shall be accountable to manage all such incidents under the framework of the National Incident Management System (NIMS) Incident Command System (ICS) structure.

3.0 **UPDATES:**

This guideline shall be subject to review on an annual basis as a minimum or whenever the authority having jurisdiction (AHD) mandates such review based upon audit or procedural updates/revision.

1. Wastewater collections and treatment supervisory staff shall meet annually for the purpose of internally auditing this guideline and making recommended changes to policy based upon evolving needs.
2. Additional review shall be made by Supervisory staff immediately following NCDENR-DWQ audit to complete updates based upon compliance audits.
3. Additional Supervisory review shall be conducted as deemed necessary by the Permittee or Operator in Responsible Charge (ORC) following internal policy audits, a major spill event, major weather event, natural disaster, or manmade disaster.
4. Updates shall made and the policy be re-circulated with latest revision date to all wastewater personnel having responsibility for SSO response, mitigation, and reporting.

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4.0 **NOTIFICATION:**

City staff receives notification of SSO events in a variety of ways which are indicated below;

1. Citizens and city employees may report SSO events via telephone, email, or other social media. Reports of an SSO by a citizen are rewarded by an established COR cash reward program administered through Public Utilities Code Enforcement. Make an attempt to secure citizen/customer name and contact information for the purpose of issuing this reward.
2. SSO events may be transmitted to COR staff by other COR departments and agencies such as; Police, Fire, Parks and Recreation, Public Works via Storm Water, Street Maintenance, or Engineering. All aforementioned agencies have routine work in around or in proximity to the collections and treatment system. These groups may come across SSO events as part of routine patrol, field investigations, or emergency responses.
3. Private engineering and land surveying firms are employed by various COR departments and private ventures to perform engineering analysis, field surveys, and reviews for myriad of design issues throughout the City. These firms regardless of their contracted employment relationships may report SSO events, as part of their professional duty.
4. Other utilities may report SSO events based upon their investigative, maintenance, repair, or construction related work.
5. Regulatory agencies and environmental stakeholders may also report SSO events discovered as part of their routine review of our systems and adjacent environments and habitats.
6. Many calls, particularly those after normal business hours, on weekends, and holidays are received and reported via 911 operators, the City call center or private call taking vendors such as Highwood's Answering Service.

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5.0 PROCEDURE:

5.1 Response and Containment:

Upon notification of a SSO event, the first priority shall be to respond to the reported site of the SSO in a safe and efficient manner to assess the situation and mobilize the necessary manpower, equipment and tools to affect an efficient and control and mitigation effort. The following steps shall be followed by staff members whether part of the normal working shift or assignment on-call;


1. Supervisor on duty shall assign the closest combo/flush truck to respond to the reported event location
2. Easement Crew shall return to or report to Operations center and remain on standby until notified by staff members at the SSO site location.
3. First arriving crew shall make a determination if SSO event is the result of a system manhole (MH) or lateral clean out (CO) overflow.
4. Verification shall be made if MH or CO overflowing is City owned or Private in nature.
5. Determine if MH or overflow area is accessible by COR equipment. If area is inaccessible by COR equipment, supervisor on-call shall notify repair crew supervisor on-call via call sheet to provide for additional resources to facilitate clearing operations for access.
6. Make notifications to appropriate Division staff members such as back up ORC or ORC.

5.2 If SSO is on Existing Clean Out:

Upon verification that SSO event is directly related to a lateral clean out being residential or commercial, the following steps shall be followed by responding staff members;

1. If the clean out exists on a COR sanitary sewer main, the responding crew shall utilize equipment and tools to flush the main in attempt to provide relief for the backup.

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2. If the existing main is a COR main and step 1 provides relief, the crew shall notify the homeowner or responsible party to contact a plumber to provide inspection and maintenance to the customer's lateral service line.
 - a. If the clean out exists on a private sanitary sewer main, the responding crew shall notify the homeowner or responsible party that a licensed plumber must be contacted to provide relief. CORPUD Code enforcement shall be notified via the Supervisor on call and given all necessary information about the SSO event.
 - b. Event shall be recorded on crew work order and submitted for record keeping

5.3 If SSO Event is MH Overflowing on COR Main:

Upon verification that the SSO event is attributed to a MH on a COR sanitary sewer main, the following steps shall be undertaken by responding staff members;


1. Crew shall immediately notify Supervisor of MH spill event including location, size of main, access issues, and surrounding upstream and downstream infrastructure.
2. Responding crew utilizes necessary equipment and tools in attempt to effect relief on blockage causing SSO event.
3. Responding Supervisor makes determination if overflow effluent has reached existing surface waters as defined in the Collections System Permit (#WQCS00002) and/or if the spill event warrants reporting to NC DENR-DWQ based upon the volume of the spill.

5.4 If SSO Event Reaches Surface Waters:

Upon verification that the SSO event has caused collections system effluent to reach existing surface waters, regardless of volume, the following measures shall be undertaken by responding staff;

1. Supervisor shall directly contact the Assistant Superintendent, Back-Up ORC or ORC of the event.
2. Supervisor shall contact additional flush/vacuum truck resources as deemed necessary based upon discharge volume and area of mitigation.
3. Supervisor shall contact Easement Crew on stand-by of necessary resources required for mitigation of the spill environment, including but not limited to pump

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equipment and discharge hose for cleaning, straw for dam construction and erosion control, lime for decontamination and neutralization, and grass seed/matting for site restoration efforts.

5.5 Upon Mitigation Crew Arrival:

Regardless of event type and cause, if on COR sanitary sewer infrastructure, the responding staff shall perform the following functions to effect control and mitigation of the discharged collections system wastewater effluent;

1. Responding crew shall attempt to stop SSO event via line breakage or cleaning/vacuuming efforts. If step 1 is not successful refer to step 8 below.
2. ORC or Back-Up ORC shall complete a site assessment and compute the volume of the SSO event, utilizing AWWA volume calculations or volume calculations based upon AWWA accepted San Diego SSO volumetric study.
3. Responding crews shall construct a dam to retain effluent in the surface water body so pumping equipment may be utilized for recovery efforts.
4. Pumps and combo trucks shall be utilized to recover effluent from surface waters and discharge this material directly into adjacent functional collections system piping via adjacent MH structures.
5. Responding staff shall wash down creek or surface water body and surrounding vegetation with potable dechlorinated water to remove all solids and also shall rake solids from spilling MH or CO structure and shall remove same via mechanical equipment or physical labor. This material shall be disposed of in an appropriate and legal manner at a CORPUD disposal site.
6. Lime shall be placed in the spill area to affect decontamination with caution to avoid lime placement in areas of immediately surrounding surface waters.
7. Straw and seed shall be employed to restore the area upon successful cleaning efforts. In the event that step 1 above is not successful, employ the steps below to manage the incident;
8. By-pass pumping shall be set up and employed to handle escaping wastewater until the blockage causing the SSO may be fixed or the line is re-opened and flow re-

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established. Pump operator/monitor shall stand by at all times to maintain pumping operation.

- a. In the event that existing pumps are unable to handle the volume of effluent escaping the collections system, Supervisor shall contact ORC or back up ORC and arrange to utilize contracted pumping rental or services to manage the wastewater volume escaping the collections system.

1. Godwin Pump (919) 795-9020
2. Sunbelt Rental (919) 233-4692 / 662-2664 / 876-9010
3. MSP Rental (919) 788-8181
4. Stone Pump (919) 788-8181 / (910) 374-0468

9. Upon establishing an operational by-pass, continue with step 2 above.

10. Upon completion of assessment and SSO control via stemming of the flow and pumping, the ORC or Back-Up ORC shall contact DWQ or Emergency management (after hours) to report the SSO event.

In the event that the SSO is on a private line, the following steps shall be undertaken to provide notification;


- a. DWQ Storm water Division is notified and they assume responsibility for the SSO event
- b. CORPUD Code Enforcement is notified of private spill event to perform necessary follow-up/enforcement actions.

5.6 Upon Successful Mitigation Effort:

Once the SSO has been successfully mitigated, the following steps shall be employed to close out the SSO response;

1. The ORC or Back-Up ORC shall inspect the SSO site within 24 hours of the reported SSO and assess the spill site and mitigation efforts.
2. Responding staff shall be instructed to remove the dam or structure employed to stem SSO flow and remove by pass pumps and equipment.

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3. All equipment shall then be removed from SSO site and cleaned off site and returned to service.

5.7 If SSO Event Occurs on Force Main:

Upon confirmation that the SSO event is occurring on a force main or pressure sewer, responding staff shall employ the following steps;

1. Staff shall utilize combo/vac truck or portable pumps and discharge hoses/piping to maintain level of the wet well at the sewage lift station while the station is shut down for repair work.
2. Staff shall determine if existing gravity sewer exists in the vicinity to pump to, and if so, by pass pumping shall be employed to convey sewage to gravity sewer.
3. By-pass pumping and monitoring and notifications shall be employed as detailed previously in this guideline.


6.0 REPORTING / RECORD KEEPING:

Proper reporting and record keeping of SSO events is paramount to meeting our NCDENR-DWQ permit requirements. The following procedures shall be employed for each SSO event;

There are three separate reporting and record keeping procedures which must be followed for each spill event. This reporting shall be performed by the Operator in Responsible Charge (ORC) or the ORTC's designee. The different reporting requirements are as follows;

- A. **24 Hour Reporting:** DWQ number for spill reporting is 919-791-4200, ask for a representative of "Surface Waters" and explain that you are reporting a spill event. After hours reporting is made by contacting State emergency management at 1-800-858-0368.

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1. Report the date and time of the SSO – “start time” is time of call receipt, “finish time” is when overflow is stopped.
2. Physical location of the SSO – address or physical location
3. Surface waters reached by spill effluent – named river, creek, or tributary, “unnamed” if an unnamed waterway but relationship to named collector
4. Total estimated gallons of SSO
5. Fish kill, how many?, size?, and type of fish if known?
6. date, time, and person’s name from DWQ that received the notification
7. Cause of the SSO
8. City/Town where SSO occurred if not Raleigh
9. Receiver may ask for collections system permit number (WQCS00002)
10. Identify if SSO was in collections system or at pump/lift station
11. Steps and procedures taken on mitigation/clean-up effort

B. Five day BIMS Report:

1. Log in to the BIMS system WQCS00002 password – SECURITY in capital letters
2. Check box for either Collections System or Pump Station
3. Enter start date/time – ie. 02/07/2012 01:00pm
4. Enter end date/time – ie. 02/07/2012 02:00pm
5. Enter weather conditions during SSO event - ie. Sunny, clear skies, mild...
6. Total gallons of spill will already be listed from step A above
7. Detail estimate of spill volume – ie. 5gpm x 60 minutes –or- 100 gph x 24 hours x 5 days.
8. If fish kill occurred, enter the number
9. Report correct name of surface water body effected by spill – verify name for correctness
10. Notification made to? – ie. DWQ staff –or- Emergency Management
11. Click on name and click on name of person that SSO was reported to via a drop down box
12. Enter the date and time the SSO was reported
13. Report signed by? ie. The person who completes the BIMS report date/time and person completing the form
14. Verify that the address is correct
15. Verify that the City/Town/County information is correct in the drop down – this is generally populated by DWQ

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16. Verify the cause of the SSO
17. Click first on the "agreement" box, then click on "save" and this will bring you to the next screen to submit the information concerning the cause, cleanup or mitigation efforts, and ORC name or Backup ORC, and the dates and times they were on location.
18. The cause may require input about maintenance such as the last time this area had PM work performed, past spill history or maintenance concerns, possibly leading to this spill event.
19. If a **main break** necessitating a repair was performed, "pipe repair" will inquire about what quantity of pipe was replaced, if H₂S is bad, what is being done to correct the problem, and if other breaks have occurred within a five year period.
20. If **grease** is the leading cause questions will be asked about a FOG, if restaurants are contributors, the most recent inspection date, the findings of that inspection and if compliance issues were identified.
21. List suspected sources of **grease and rags**.
22. If **roots** is the leading cause, answer questions about PM root work in the area.
23. If **vandalism** is the leading cause, supply a Police Department report number.
24. make a copy
25. Click on submit questions button
26. Forward a copy of the BIMS report to Marti Gibson or designated staff member.

C. SSO Master List Spreadsheet:

1. Date of SSO
2. Location of SSO
3. Surface waters reached
4. Total estimated gallons
5. Fish kill
6. Date of last cleaning or PM
7. Map page
8. Date of enforcement letter mailing
9. Duration of SSO
10. Cause of SSO

7.0 RESOURCES:

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The following materials and equipment are available at the Utility Field Operations Center for SSO mitigation efforts;

Portable diesel and gas trash pumps

Portable lighting

Centrifugal pumps

ATVs / Argo for access

Tractors w/implements

4wd vehicles for access

Suction and by pass hose and fittings

Discharge piping

Powdered lime

Combo Flush / Vacuum trucks

Rubber tired backhoes

Mini and full size track excavators

Front end loaders

Track loader

Dozer


Lowboy trailer and tractor

Dump trucks (6 and 10 wheel)

Mowers

Chain saws and weed eaters

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Trailers for equipt/mat'l hauling

Straw bales

Grass seed

8.0 CONTACT INFORMATION:

The weekly CORPUD Emergency Contact List shall be employed for CORPUD access information. Below is a listing of additional resources that may be necessary for support and reporting.


Emergency contact numbers for after hours on nights, weekends, and holidays;

(919) 829-1930 or (919) 829-1911

Other numbers;


1. Tom Johnson, Assistant Sewer Maintenance Superintendent
250-7828 office, 796-7418 cell, Nextel 150*26*13195
2. Julian Ryan, Utility Supervisor I
250-7864 office, 796-6396 cell, Nextel 150*27*4865
3. Matt Vessie, Sewer Maintenance Superintendent
250-2741 office, 796-7316 cell, Nextel 150*226*18925
4. Will obtain other contact info during final draft

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- 1.0 **PURPOSE:** To provide instruction to the City of Raleigh staff to complete bank stabilization due to erosion and to meet regulatory standards set by governing Organizations (State and Federal).
- 2.0 **ORGANIZATIONS AFFECTED:** City of Raleigh Public Utilities & Public Works (Storm Water Division) and contractors, DWQ, DENR, Army Corps of Engineers, and Environmental Consultants.
- 3.0 **REFERENCE:** Collection System Permit #WQCS00002, Public Utilities Handbook, NCDNER NCAC Chapter 2 subchapter B.0100, .0200, and .0300 rules in NC's surface waters and wetlands standards.

IDENTIFY REGULATIONS

- Section 404 of the Clean Water Act is enforced by the US Army Corps of Engineers
- Nationwide Permit 3 Maintenance
- Nationwide Permit 12 Utility Lines
- Nationwide Permit 13 Bank Stabilization
- 401 Certification is issued by the North Carolina Division of Water Quality
 - Water Quality Certificate #3687 = NWP 3 Maintenance
 - Water Quality Certificate #3819 = NWP 12 Utility Lines
 - Water Quality Certificate #3689 = NWP 13 Bank Stabilization
 - Neuse Riparian Buffer Protection Rules
 - Enforced by the North Carolina Division of Water Quality


Supporting DOP's needed:

- Construction of temporary road
- Backfill and Compaction
- Construct temporary Creek/Stream Crossings
- Bypass pumping/pump around
- Easement maintenance
- Easement Inspections
- Herbicides Applications

4.0 **DEFINITIONS:**

NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
PROTECTION AND MAINTENANCE OF EXISTING RIPARIAN BUFFERS

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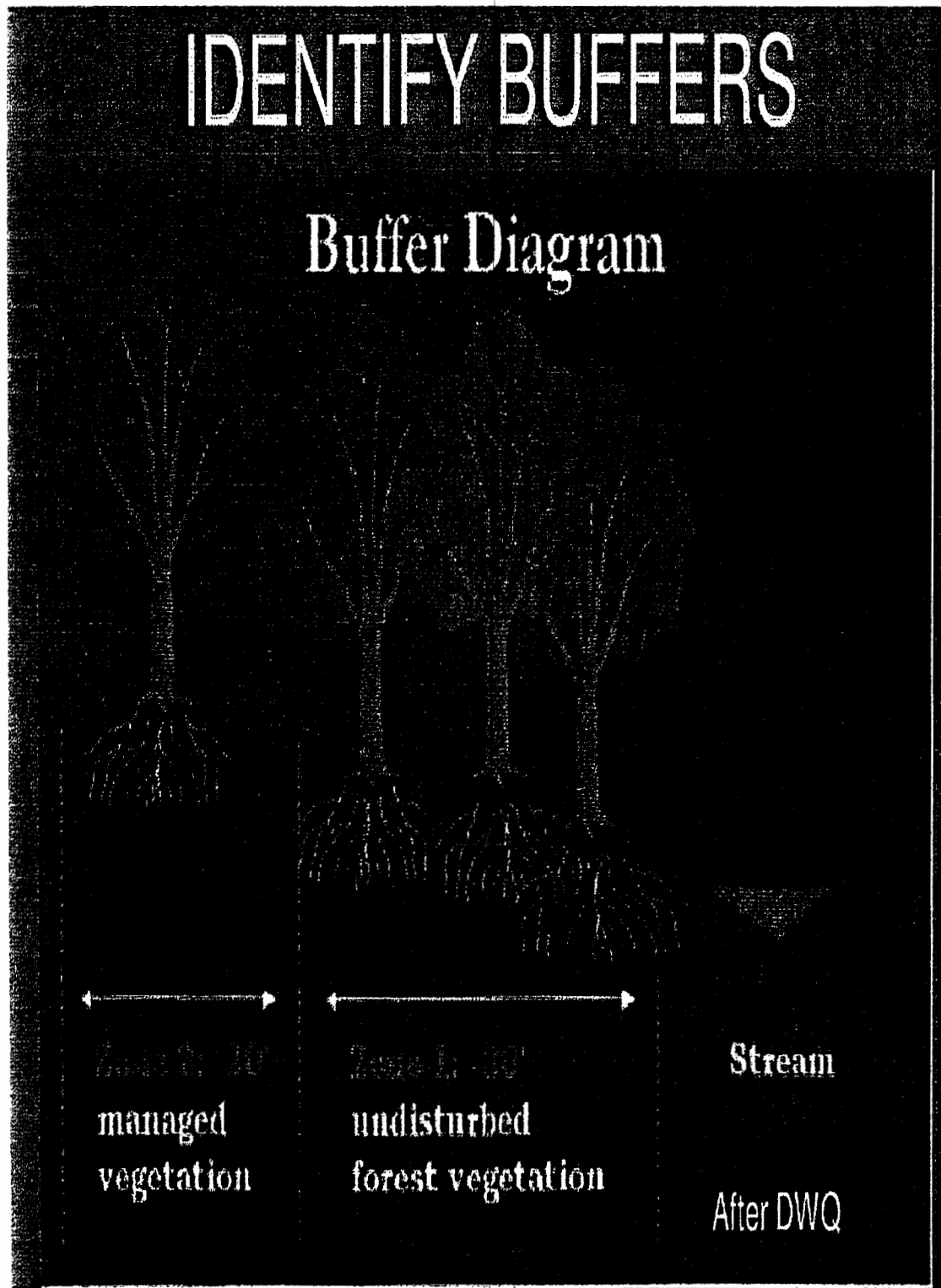
APPLICABILITY. This Rule shall apply to 50-foot wide riparian buffers directly adjacent to surface waters in the Neuse River Basin (intermittent streams, perennial streams, lakes, ponds, and estuaries), excluding wetlands. Except as described in Sub-Item (4)(a)(iii) of this Rule, wetlands adjacent to surface waters or within 50 feet of surface waters shall be considered as part of the riparian buffer but are regulated pursuant to 15A NCAC 2H .0506. The riparian buffers protected by this Rule shall be measured pursuant to Item (4) of this Rule. For the purpose of this Rule, a surface water shall be present if the feature is approximately shown on either the most recent version of the soil survey map prepared by the Natural Resources Conservation Service of the United States Department of Agriculture or the most recent version of the 1:24,000 scale (7.5 minute) quadrangle topographic maps prepared by the United States Geologic Survey (USGS). Riparian buffers adjacent to surface waters that do not appear on either of the maps shall not be subject to this Rule. Riparian buffers adjacent to surface waters that appear on the maps shall be subject to this Rule unless one of the following applies.

Buffer: a natural or vegetated area through which storm water runoff flows in a diffuse manner so that the runoff does not become channelized and which provides for infiltration of the runoff and filtering of pollutants. The buffer shall be measured landward from the normal pool elevation of impounded structures and from the bank of each side of streams or rivers


- A stream buffer is the area 50 feet landward from the top-of-bank of any "blue-line" stream in the Neuse Basin
- Zone 1 = first 30 feet landward from top-of bank
- Zone 2 = next 20 feet landward

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Blue Line Streams: In general, surface waters are the “blue lines” shown on either the most recent United States Department of Agriculture (USDA) soil map or the most recent United States Geologic Survey (USGS) 7.5 minute quadrangle map. The stream is the area from top-of-bank to streambed, regardless of whether it is carrying water.

Construction entrance: A stabilized pad of aggregate underlain with filter fabric located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

Easement: A utility easement is an easement that allows a utility the right to use and access specific area of another's property for laying gas, electric, water, and sewer lines. A utility easement is attached to the property deed so that it passes on even when the property is transferred or sold. Having an easement gives the utility the right to use the land, **but the utility does not own it.** However, the property owner may encounter certain restrictions on land use in an area covered by a utility easement.
Railroad Easement– Investigate proprietary restrictions

Erosion control matting: is natural or synthetic material used to stabilize channels or steep slopes until vegetation is established; matting maybe temporary or permanent depending on material type.


Footprint of Stream Channel: Looking down at the stream, this would be the area from bank to bank. The stream footprint is the area from bank to bank in an area of interest. For example, if a stream was 10 feet wide and you were planning to disturb the entire stream, from bank to bank along 20 linear feet, the footprint of the disturbance would be 200 square feet (10 ft x 20 ft).

In the Dry: To work within a creek/stream bed without the active flow of water. Damming or pump around/by-pass pumping used to keep flow of water out of work area.

Right of Way

1) **Right to cross property:** the right to cross somebody else's property by a specific route, e.g. as a means of accessing your own property.

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2) Lawful route across somebody's property: a lawful route that may be taken across somebody else's property

Riparian area: an area that is adjacent to a body of water

Neuse River Riparian Buffer Protection Rules

- Buffer disturbances associated with: maintenance or repair of aerial structures or manholes replacement of sanitary sewer lines, aerial structures, or manholes (without relocating)
- Bank stabilization
- Easement maintenance (tree work, mowing) are exempt when performed in an easement that has received ongoing maintenance...has been maintained within the last 10 years

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IDENTIFY REGULATIONS


Buffer Diagram

After DWQ

Neuse Riparian Buffer Protection Rules

401/404 Rules

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Rip Rap: is a design tool developed for use in the hydraulic design of rip-rap bank protection. Rip-rap is the term given to loose rock armor, usually obtained by quarrying, which can be employed to provide protection to actively eroding or potentially eroding banks in rivers and channels.

Site plan: Means a drawing not necessarily drawn to scale that shows the existing and proposed property lines with dimensions, and the specific location of all structures and proposed structures and appurtenances, including decks, porches, pools, driveways, out buildings, existing and proposed wastewater systems, existing and proposed wells, springs, water lines, surface waters or designated wetlands, easements, including utility easements, and existing or proposed chemical or petroleum storage tanks above or below ground (examples).

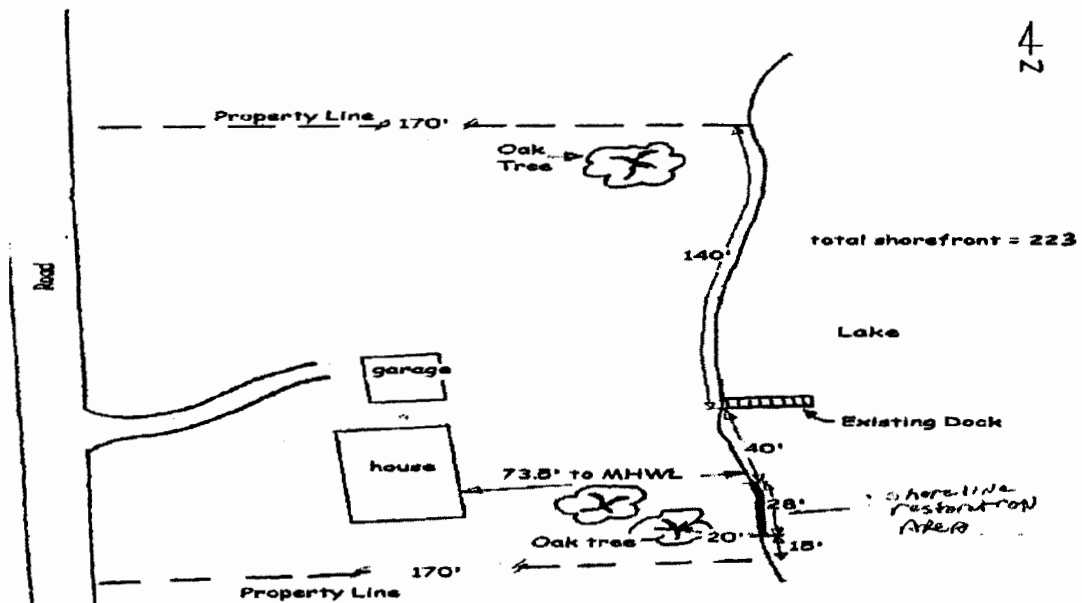
2 different example of a site plan

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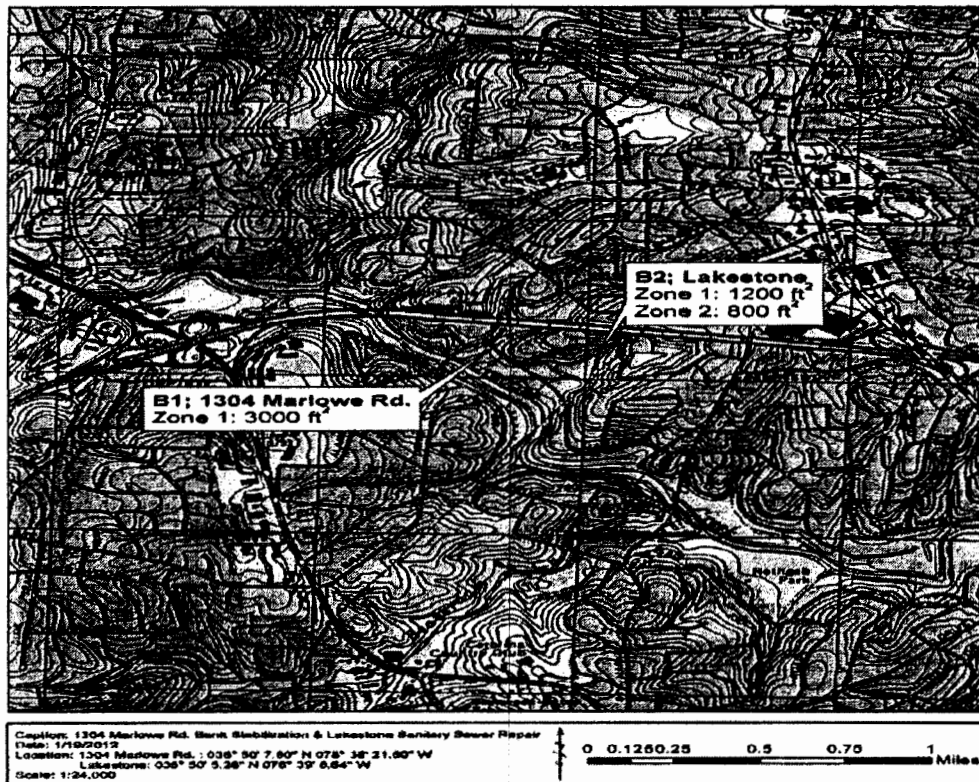
GENERAL SITE PLAN - Shoreline Project

general site plan must reflect your specific site conditions showing all existing proposed features/structures.



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Silt Fence: Is a temporary sediment barrier made of woven, synthetic filtration fabric supported by either wood or steel posts.

Toe of Rip Rap: Depth of the toe should be approx. 1.5 x Thickness. This is the anchor of the bottom of the slope to stabilize rip rap (see Construction procedure).

Tributary: Stream feeding larger body of water: a stream, river, or glacier that joins a larger stream, river, or glacier, or a lake; does not flow into sea or ocean.

Wastewater: Means the liquid and water-carried industrial or domestic wastes from dwellings, commercial buildings, industrial facilities, mobile sources, treatment facilities and institutions, together with any groundwater, surface water, and storm water that may be present, whether treated or untreated.

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Water Quality: Refers to the physical, chemical and biological characteristics of water. [1] It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. [2] It is most frequently used by reference to a set of standards against which compliance can be assessed. The most common standards used to assess water quality relate to health of ecosystems, safety of human contact and drinking water.

Wetlands: are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Must include indicators of wetland soils, vegetation, and hydrology (all three must be present).

5.0 **PROCEDURE:**

5.1 Provide pre-construction photo documentation

- Identify problem
- Take pictures and document
- Pictures should be taken before and after from same point of view
- Pictures should be detailed to include entire work zone.
(I.e. Curbs, sidewalks, driveways, adjacent properties that are crossed, constructions entrances and exits, or any disturbed properties)


5.2

- Notify Environmental Consultants for permitting if necessary
 - after action permitting may be permissible during emergencies
- Determine impact and make decisions on means of Construction

IMPACT TO WETLANDS, STREAMS, AND BUFFERS

- Maintenance = Maintenance or repair of aerial structures or manholes
- Utility Lines = Replacement of sanitary sewer lines, aerial structures, or manholes
- Bank Stabilization = Stream bank stabilization
- All of the above are assumed to cause buffer disturbance
- Easement maintenance = Buffer Disturbance

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MAINTENANCE: Maintenance, Installation or Repair of Aerial Structures or Manholes

1. Does the work impact >150 feet of stream or wetland?
 - 401/404 permit needed
2. Does the work impact >1/10th acre of wetland?
 - 401/404 permit needed
3. Does the work include removal of sediment or debris within 200 feet of an existing structure?
 - 401/404 permit needed
4. Does the work take place within a corridor that has not been maintained within the past 10 years?
 - Buffer permit needed


REPLACEMENT OF UTILITY LINES: Replacement of sanitary sewer lines, aerial structures, or manholes

1. Does the work impact >150 feet of stream or wetland?
 - 401/404 permit needed
2. Does the work impact >1/10th acre of wetland?
 - 401/404 permit needed
3. Does the work include mechanized clearing in a forested wetland?
 - 401/404 permit needed
4. Does the work result in permanent changes in pre-construction elevations or stream dimensions?
 - 401/404 permit needed
5. Does the work take place within a corridor that has not been maintained within the past 10 years?
 - Buffer permit needed

STREAMBANK STABILIZATION


1. Does the work impact >500 feet of stream?
 - 401/404 permit needed
2. Does the work involve a fill greater than an average of one cubic yard per running foot along the bank below the ordinary high water mark?
 - 401/404 permit needed
3. Does the work disturb a special aquatic site/wetland?
 - 401/404 permit needed
4. Is the work a non-exempt activity in accordance with the Neuse Buffer Rules?

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- 401/404 permit needed
- 5. Does the work take place within a corridor that has not been maintained within the past 10 years?
 - Buffer permit needed
- 5.3 Notify homeowners
 - Code enforcement to verify easement
 - Send notification letters (door hangers/letters)
- 5.4 Survey easement
 - Currently we are utilizing Public works to survey
- 5.5 Clear easement if necessary
 - Determine if clearing can be performed in house our must be outsourced.
 - Clear easement with in house labor/staff
 - (see easement maintenance DOP)
 - Generate work order for outsourcing
 - Generate work order for Parks & Rec. Dept.-Tree Trimmers
- 5.6
 - Construct temporary access road if necessary (separate DOP)
 - Construct temporary Creek/stream crossings (separate DOP)
 - Determine size and depth of pipe
- 5.7 **CONSTRUCTION REQUIREMENTS**
 - Install and maintain erosion control measures
 - Silt fence
 - Construction entrance
 - Seeding and mulch/straw
 - Avoid/minimize use of mechanical equipment
 - Heavy equipment working in wetlands or streams must be placed on mats or other measures must be taken to minimize soil disturbance
 - Work perpendicular to streams
 - Limit the maintenance corridor within streams and buffers to 15 feet wide
 - All work shall be completed "in the dry"
 - Return the site to pre-existing contours when possible
 - No "live" concrete in contact with water (wet or fresh concrete)
 - Sanitary sewer that crosses a stream shall be installed with no joints within the footprint of the stream channel or within 2 feet of the banks

DEPARTMENTAL OPERATING PROCEDURES

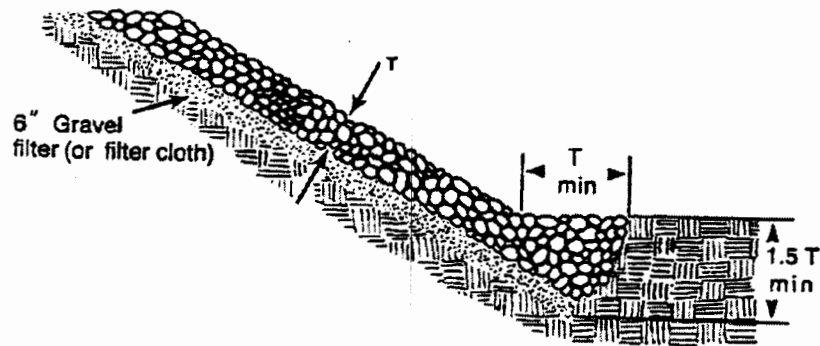
<p>City of Raleigh, NC</p> 	<p>MANUAL</p> <p>Sewer Maintenance</p> <p>Utility Management System Manual</p>			
<p>SUBJECT</p> <p>Sewer Easement Repair</p> <p>Bank Stabilization</p>	<p>NUMBER</p> <p>SER-0001</p>	<p>REV</p>	<p>EFFECTIVE DATE</p> <p>Month year</p>	<p>PAGE OF</p> <p>13 15</p>
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in the case of PVC pipe, or with properly bedded and supported ductile iron (maybe sleeved or encased if necessary)

- Herbicides can be applied in wetlands or other waters ONLY when applied by a certified applicator, and in strict accordance with product labeling. Never in buffer!

Rip Rap.....It's All About the Toe

Figure 6.15b Riprap slope protection
(modified from VDH&T).




- Minimize the use of rip rap when possible
- Rip rap shall not be installed in a streambed
- Rip rap should not be used on slopes greater than 2H:1V
- Thickness of rip rap should be no less than 1.5 x D50 (approximately 21" for Class II)
- Depth of the toe should be approx. 1.5 x Thickness (approx. 30" for Class II or Class B)
- Preparation of subgrade must allow for rock thickness so that finished grade of rock matches existing grade of bank

5.8 Install or remove fill to ensure proper slope of bank.
If necessary, excavate the bank so that the final riprap slope will be no steeper than 1(h):1(v) and no shallower than 3(h):1(v). Do not remove existing vegetation. Create a trench in the bank toe that is at least as deep as the height of your largest riprap stone.


5.9 Perform compaction of fill as needed to provide a stable bank. (Separate DOP).

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- 5.10** Once proposed slope is properly constructed, install erosion control matting on bank by securing with staples. Work and secure erosion control matting from top of slope to toe, stopping just shy of the stream bed. Key in filter fabric at the top of the riprap edge and extend it into the toe trench.
- 5.11** Begin placement of rip rap material on slope keeping all rip rap out of stream.
1. Immediately install the riprap layer. First place an anchoring row of large rocks in the trench at the toe of the bank. Rip rap stones shall then be hand-placed or very carefully mechanically placed, maintaining control so that smaller stones fill the voids between larger ones. No erosion control matting shall be exposed upon completion of rip rap placement. The rip rap layer shall be at least twice as thick as the average rock diameter.
 2. Ensure that the rip rap extends up the slope at least 2' past the top of bank.
 3. Disturbed soil, at top of slope beyond placed rip rap, shall be immediately stabilized with seed and hay mulch or permanently restored with ground tree bark mulch.
- 5.12** Provide post-construction photo documentation
- Take pictures and document
 - Pictures shall be taken before and after from same point of view
 - Pictures shall be detailed to include entire work zone. (i.e. Curbs, sidewalks, driveways, adjacent properties that are crossed, constructions entrances and exits, or any disturbed properties)
 - Post-construction photo documentation shall be required for Environmental Consultant to close out permit.
- 5.13** Work orders to be completed daily to include
- Quantity and material type of loads hauled (aggregate) on and off site (tons/yards/ trucks)
 - Units of measure
 - Aggregates = Tons


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- Topsoil = Cubic Yards
- Fill = Truck Loads
- Debris = Cubic Yards or Truck Loads
- Personnel on site
- Hours' work
- Equipment on job site
- Scope of work
- Date

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	SUBJECT Sewer Easement Repair NC One Call Procedure	NUMBER SER-0002 SUPERSEDES	REV PREPARED BY	EFFECTIVE DATE Month year PAGE 1 OF 7 Approved by

1.0 PURPOSE: To give detailed instructions and proper procedural guidelines to all Sewer Maintenance Division staff members who shall contact the North Carolina 811-One Call Center prior to **all/any** field excavation operation. Notifying the North Carolina 811- One Call Center is a requirement of **North Carolina State Law**. It aids in the prevention of damage to underground utility owners' and operators' facilities in the State of North Carolina.

2.0 ORGANIZATIONS AFFECTED:

CORPUD SEWER MAINTENANCE AND WATER DISTRIBUTION DIVISION

AUTHORIZED CONTRACTORS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT)

3.0 REFERENCE:

- North Carolina 811 Excavation Guide (www.nc811.org)
- The State of North Carolina Underground Damage Prevention Act General Statute 87 Article 3.
- Subsurface Utility Engineering Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data CI/ASCE 38-02
- American Public Works Association (APWA) (<http://apwa.net/>)
- Wake County Register of Deeds (<https://rod.wakegov.com/>)
- NCDOT Utilities Unit (<http://www.ncdot.gov/doh/preconstruct/ps/design/>)
- OSHA Standards 1926


4.0 DEFINITIONS:

Color Code Assignments: The North Carolina 811 One Call Center and its utility marking subsidiaries' adhere to the APWA Uniform Color Code for marking underground utility lines.

- White Marking Paint—is used to mark and outline the Proposed Excavation area.
- Pink Marking Paint—Indicates Temporary Survey Markings
- Red Marking Paint—Indicates the presence of Electric Power Lines, Cables, Conduits and Lighting Cables
- Yellow Marking Paint—Indicates the presence of Gas, Oil, Steam, Petroleum or Gaseous Materials (such as oxygen lines at local Hospitals)
- Orange Marking Paint—Indicates the presence of Communication, Alarm or Signal lines, Cables, Cable Television (CATV) or Conduit
- Blue Marking Paint—Indicates the presence of Potable Water and Chilled Water
- Purple Marking Paint—Indicates the presence of Reclaimed Water, Irrigation, and Slurry lines
- Green Marking Paint—Indicates the presence of Sewers and Drain lines

Damage: includes the substantial weakening of structural or lateral support of an underground utility, penetration or destruction of protective coating, housing, or other protective device of an

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underground utility, and the partial or complete severance of an underground utility.

Excavate: or "excavation" means an operation for the purpose of the movement or removal of earth, rock, or other materials in or on the ground by use of equipment operated by means of mechanical power and/or an operation by which a structure or mass of material is wrecked, razed, moved, or removed by means of any tools, equipment, or discharge of explosives.

One-call notification center: An entity that administers a system through which a person can notify utility owners and operators of a proposed excavation. Typically, the one-call center notifies member utility owners and their utility marking subsidiaries', to mark the ground surface for existing underground utilities.

One-call statute: A local or state requirement that an excavator or designer of excavation call a central number to notify some or all existing utility owners of that planned excavation.

Tolerance Zone and Location of underground utilities: means a strip of land not wider than the width of the underground utility plus two and one-half (2 1/2) feet on either side of the underground utility.

(The) State of North Carolina Underground Damage Prevention Act requires anyone, except as provided in General Statute 87.106, before commencing all excavations in highways, public spaces or in private easements of utility owners to notify each utility owner having underground utilities located in the proposed area to be excavated, either orally or in writing, not less than two nor more than ten business days prior to starting, of the intent to excavate.

Utility locating: is the process of identifying, marking, and depicting the presence of underground utilities; such as telephone, electric, natural gas, cable television, fiber optics, traffic control lights, street lights, storm drains, water mains, and wastewater pipes within prior to an area about to be excavated. Additional underground utilities may include; major oil and gas pipelines, national defense communication lines, mass transit, road, rail, steam and chilled water utility tunnels.


Utility owner: means any person who owns or operates an underground utility.

Underground utility: means any underground line, system or facility used for producing, storing, conveying, transmitting, or distributing communication or telecommunication, electricity, gas, petroleum and petroleum products, coal slurry, hazardous liquids, water under pressure, steam, or sanitary sewage, but not including traffic signal control cables and vehicle detection cables of the North Carolina Department of Transportation.

5.0 **PROCEDURE:**

5.1... Visit the jobsite, evaluate and determine the scope of the work necessary to perform excavation.

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5.2... Use **white utility marking paint** and outline the dimensions of the Proposed Excavation area.

5.3... Call the North Carolina One Call Center by dialing "811" (1-800-632-4949).

5.3.1... Ticket Guidelines – The following is a list of questions in the order that they will be asked by a Customer Service Representative when a standard notification is being made. **Customer Service Representative will not ask if the notification is an emergency (Refer to 5.6.2 in this D.O.P for further details).**

Company Telephone Number, Company Address, Name of Business, Caller Name, Email Address, County, Place/City/Town, In or Out of City Limits, Subdivision, Address, Nearest Cross-Street Name, Intersection, Area to locate, Blasting, Boring, Railroad, Work Date & Time, Duration of Work, Work Type, Work Done For (see Appendix A for Copy of Notification Form)

5.4... Document locate ticket number, person who you spoke with, date and time called, the date and time the excavation area will be marked, the date the ticket can be renewed, and the utility owners who will be notified. (see Appendix A for Copy of Notification Form)

5.4.1... Sewer Maintenance Division Operators are responsible for the marking or the verification of **all sewer mains, sewer service laterals, and sewer taps** located within the excavation area. Sewer Maintenance Division Operators are responsible for the marking or the verification of **water mains, water service laterals, and Reuse water.**


5.5... Sewer Maintenance Division Operators are responsible for contacting those Utility owners who are not members of the One-Call notification system. Identifying non-members can be a difficult task and may require that the NCDOT Utilities Unit or the City of Raleigh Transportation Field Services Division be notified. These organizations facilitate and manage the relocation, adjustment, removal, and addition of utilities through the review and management of preliminary plans, infrastructure construction drawings, and utility encroachment programs. These organizations might possess critical point of contact information or actual route information of where a non-member utility owner facility may lie.

5.5.1... Non-member utility operators or owners may include but are not limited too:

- North Carolina State University
- Home Owners
- Meredith College
- Shaw University
- North Carolina Department of Transportation-Traffic Control Signals

- State of North Carolina Construction Office – Steam, Chilled Water, and Utility Tunnels
- City of Raleigh – Public Works – Storm Water
- City of Raleigh – Public Works – Traffic Signals

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- DukeNet
- PalmettoNet
- Level 3 Communications
- Earthlink (note: track down some POC info, include info in Appendix B)

5.6... Wait for the Marks....

5.6.1... NC One Call issues a notice to utility owners and/or contract utility locating agencies at 12:01 am the following business day. The contract utility locating agencies have two business days to respond to the locate request. (As per the NC One call notification center)

5.6.2... Emergency Request:

The caller must state that the notification is an emergency. Emergency notifications are transmitted to member utility operators immediately. Members will mark their facilities in the emergency area as soon as practical. In the event of an emergency, operators are still required to follow thru with step 5.5 of this D.O.P to contact non-member utility owners and operators.

5.6.3... Prior to beginning any/all excavation activities verify that the jobsite has been marked. Proceed under the following guidelines if there are no visible paint marks within the Proposed Excavation area.

5.6.4... If jobsite is not marked, proceed with the following recommendations agreed upon by the assigned sub committee.


1st... notify the NC One Call notification center following the guidance provided in step 5.3 of this procedure and provide the notification center with the information collected in steps 5.3.1 and 5.4.

2nd... Allow a minimum of two hours for the contract utility locating agency to respond.

5.6.5... If no response; adhere to the following OSHA Standards and guidelines which dictate:

1926.651(b)(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the

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employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used (Refer to Test Hole D.O.P on how to proceed when there has not been a response from the contract utility locating agency(ies).

5.7... Proceed with scheduling the assigned work and notify Sewer Maintenance Staff.

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Appendix A... Notification form next page.

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Appendix B... List of Utility Owners and Operators, next page.

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SUBJECT	NUMBER SER-0003	REV	EFFECTIVE DATE	PAGE	OF
Backfill and Compaction	SUPERSEDES	PREPARED BY	Approved by	1	7

1.0 PURPOSE: To provide instructions for the backfilling and compaction of trenches associated with sewer main repairs in streets and easements.

2.0 ORGANIZATIONS AFFECTED:

RALEIGH SEWER OPERATIONS

SOUTH RALEIGH SEWER OPERATIONS

EAST RALEIGH SEWER OPERATIONS

NORTH RALEIGH SEWER OPERATIONS

AUTHORIZED CONTRACTORS

NCDOT

MERGER TOWNS

3.0 REFERENCE:

- PUBLIC UTILITIES HANDBOOK
- REPAIR DOP
- MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES
- DEPARTMENT OF TRANSPORTATION HANDBOOK

4.0 DEFINITIONS:

4.1 Trench backfill - Trench backfill is defined as the placement and compaction of material in a trench between the top of the pipe and the bottom of the pavement base material in streets, or finished grade in easements.

4.2 Compaction - is the process by which a soil mass is subjected to compressive forces for the purpose of decreasing the volume of voids, thereby increasing the dry density. Decreasing the volume of voids would mean decreasing the volume occupied by air and water. Water is incompressible; meaning the volume occupied by a given quantity of water cannot be reduced further. Air is compressible; and applying compaction methods removes the air volume. This process typically involves tamping, rolling, or vibration, or a combination of these processes. This results in a relocation of soil particles and the expulsion of air from the soil mass.

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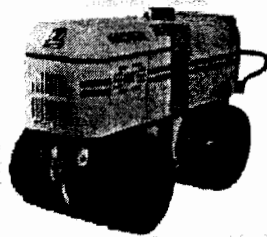
City of Raleigh, NC	<div>MANUAL</div> <div>Sewer Maintenance</div> <div>Utility Management System Manual</div>			
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4.3 AC Pipe -- Asbestos cement (AC) pipe was used widely in the mid-1900's in potable water distribution systems. Since the lifetime of this product is approximately 70 years, many projects to update this infrastructure involve removal of this product. The cement acts as a binder that holds the asbestos fibers within a solid matrix. This will prevent asbestos fibers from being released easily, unless mishandled, damaged, or in badly weathered condition. In most cases, AC pipe is considered non-friable or not easily crumbled or reduced to powder; crumbly: *friable rock*.

4.4 Friable – easily crumbled or reduced to a powder; crumbly


4.5 Screening – finely crushed aggregate resembling sand; grey in color, typically used in building and construction industry.
ADD PHOTO OF SCREENING

4.5 Compaction equipment –



Vibratory Roller Compaction Equipment

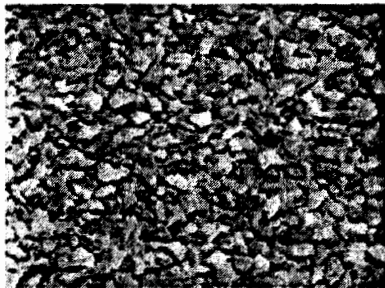
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Wacker or Jumping Jack Tamps

4.6 Processed Fill – also known as aggregate- GEOLOGY- resembling rock: describes a mixture of minerals or rock fragments. Crushed rock, or sand and gravel, used in civil engineering and construction work in a bound (as concrete) or unbound condition.



4.7


4.7 #57 Stone -- #57 blue-gray slate stone mined; 1/4-3/4 inch in size average, used for bedding sewer pipes, for top layer of driveways, and for decorative areas for texture



4.8

4.8 Crush & Run (ABC) -- Crusher run is a mixture from 1" in size all the way down to dust. The dust or "the fines" are screened in the plant. Ideal for driveways because it compacts nicely and stays together well, making it easier to drive on or walk across.

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5.0 PROCEDURE for Backfilling and Compaction in Paved Streets:

5.1... Temporary Traffic Control signs and channeling devices shall remain installed throughout the backfill and compaction process. Adhering to the standards and guidelines outlined in the Manual for Uniformed Traffic Control Devices for Work Zones, and all applicable federal, state and local codes.

5.2... The following preparations are required to be completed prior to backfilling and compacting trench excavations:

5.2.1... All hand tools, trash (bottles, old repair items, etc), and pipe debris shall be removed from the excavated trench.

Exception to 5.2.1...– Asbestos cement (AC) pipe shall be crushed by use of excavator and abandoned in place.

5.2.2... Appropriate bedding consisting of #57 stone (often referred to as wash stone) shall be placed below the installed pipe section and up the sides of the installed pipe section to the spring line. (Refer to Detail).

5.3... Adhere to the following guidelines and material requirements for backfilling trench excavations in streets:

5.3.1... No rocks, boulders or stone four inches in diameter or larger shall be included in the backfill material for the first two feet above the installed pipe section.


5.3.2... Processed fill and/or Screening shall be used to cover the installed pipe section from the top of the #57 stone that exist at the spring line, to 12 inches below the existing grade of the pavement surface (Refer to Detail).

5.3.3... The 12 inches that remain shall be filled with crusher run (ABC).

5.4... The following are the Compaction requirements for trench excavations in paved streets:

5.4.1... Backfill shall be compacted to maximum soil density.

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5.4.2...All backfill material shall be compacted in lifts. The height of the lift is dependent on the type of compaction equipment available.

5.4.2.1... The use of Wacker or Jumping Jack Tamps requires lifts be made every six inches.

5.4.2.2... The use of Vibratory Roller Compaction Equipment requires lifts be made every twelve inches.

5.4.3 Backfilling with frozen and/or wet material is NOT allowed.

6.0 Procedure for Backfilling and Compaction in Easements

6.1... Temporary Traffic Control signs and channeling devices shall remain installed throughout the backfill and compaction process. Adhering to the standards and guidelines outlined in the Manual for Uniformed Traffic Control Devices for Work Zones, and all applicable federal, state and local codes.

6.2... The following preparations are required to be completed prior to backfilling and compacting trench excavations:

6.2.1... Excavations shall be prepared in accordance with the following requirements:


Excavations shall be prepared in accordance with the following requirements:

6.2.2... Excavations shall be prepared in accordance with the following requirements: (Refer to Detail)

6.3... Adhere to the following guidelines and material requirements for backfilling trench excavations in Sanitary Sewer Easements:

6.3.1... No rocks, boulders or stone four inches in diameter or larger shall be included in the backfill material for the first two feet above the installed pipe section.

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6.3.2... Installed pipe section shall be covered with suitable native material.
(Refer to Detail).

6.4... The following are the Compaction requirements for trench excavations in Sanitary Sewer Easements:

6.4.1... Backfill shall be compacted to maximum soil density.

6.4.2... Sewer pipe shall be backfilled with suitable native material. Where excavated material has been rendered unsuitable because of weather, soil type or soil moisture it shall be replaced with dry suitable native material or processed fill.

6.4.3...All backfill material shall be compacted in lifts. The height of the lift is dependent on the type of compaction equipment available.

6.4.4... Backfilling with frozen and/or wet material is NOT allowed.

6.4.5... Backfilling with frozen and/or wet material is NOT allowed.

6.4.6... Backfilling with frozen and/or wet material is NOT allowed.


6.4.4 Backfilling with frozen and/or wet material is NOT allowed.

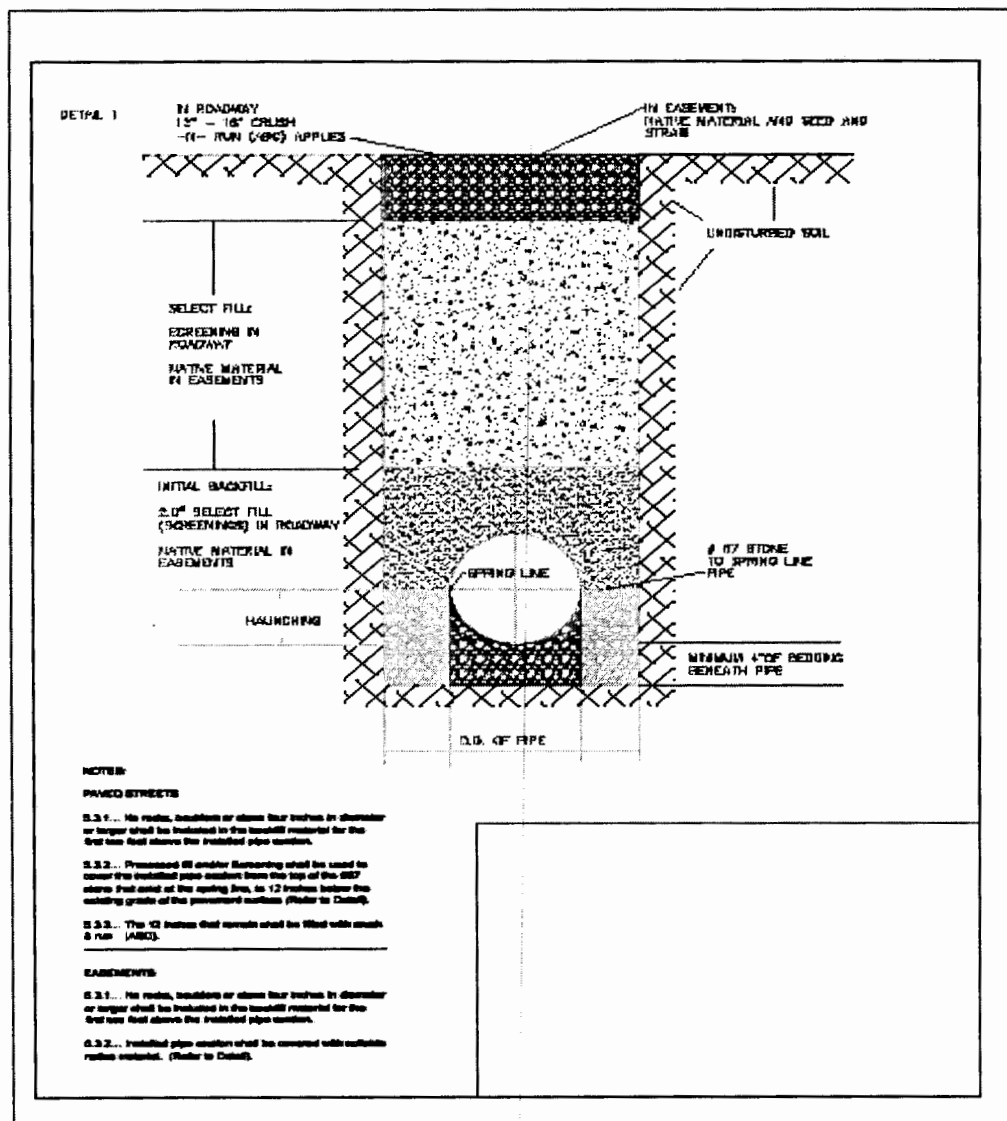
7.0 Attachments

DETAIL 1


MEMORANDUM: Dated December 01, 2009

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SUBJECT Installation and Replacement of Sanitary Sewer Manholes	NUMBER SER-0004	REV	EFFECTIVE DATE	PAGE 1 OF 13
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1.0 PURPOSE: To provide guidance and procedure to Sewer Maintenance Division staff performing installation and replacement of Sanitary Sewer Manholes.

2.0 ORGANIZATIONS AFFECTED:

CORPUD SEWER MAINTENANCE DIVISION
 CORPUD WATER DISTRIBUTION
 MERGER TOWN AUTHORITIES
 AUTHORIZED CONTRACTORS – CORING AND TAPPING FIRMS
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 THE NORTH CAROLINA 811 ONE CALL CENTER
 STREET MAINTENANCE


3.0 REFERENCE:

811 Excavation Guide (www.nc811.org)
 NC General Statute 87.106
 CI/ASCE 38-02
 American Public Works Association (APWA) (<http://apwa.net/>)
 OSHA standard 1926 Subpart P – Excavations
 City of Raleigh Public Utilities Department Handbook
 North Carolina Department of Transportation Maintenance / Utility Traffic Control Guidelines
 Manual for Uniform Traffic Control Devices
 Operation and Maintenance of Wastewater Collection Systems, Vol. I
 1910 Occupational Safety and Health Standards General Environmental Controls J
 1910.146 Permit-required confined spaces
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9797)

Supporting DOPs

Repair DOP
 Planning DOP
 By Pass Pumping DOP

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4.0 DEFINITIONS:

Accepted engineering practices: means those requirements which are compatible with standards of practice required by a registered professional engineer.

Bedding: The prepared base or bottom of a trench or excavation on which a pipe or other underground structure is supported.

Cave-in: means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Competent person: A person(s) who has been certified; one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Damage: includes the substantial weakening of structural or lateral support of an underground utility, penetration or destruction of protective coating, housing, or other protective device of an underground utility, and the partial or complete severance of an underground utility.

Excavation: means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Faces or sides: means the vertical or inclined earth surfaces formed as a result of excavation work.

Failure: means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Flow Line: The top wetted line, the water surface or the hydraulic grade line of water flowing in an open channel or partially full conduit.


Hazardous atmosphere: means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

Invert: The lowest point of the channel inside a pipe, conduit, canal, or manhole.

Ramp: means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Support system: means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the faces or sides of an excavation.

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Trench (Trench excavation): means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of the a trench (measured at the bottom) is not greater than 15 feet.

One-call notification center: An entity that administers a system through which a person can notify utility owners and operators of a proposed excavation. Typically, the one-call center notifies member utility owner(s) and their utility marking subsidiaries', to mark the ground surface for existing underground utilities.

One-call statute: A local or state requirement that an excavator or designer of excavation call a central number to notify some or all existing utility owners of that planned excavation.

Tolerance Zone and Location of underground utilities: means a strip of land not wider than the width of the underground utility plus two and one-half (2 1/2) feet on either side of the underground utility.

Utility locating: is the process of identifying, marking, and depicting the presence of underground utilities; such as telephone, electric, natural gas, cable television, fiber optics, traffic control lights, street lights, storm drains, water mains, and wastewater pipes prior to an area about to be excavated. Additional underground utilities may include; major oil and gas pipelines, national defense communication lines, mass transit, road, rail, steam and chilled water utility tunnels.

Utility owner: means any person or agency who owns or operates an underground utility.

Underground installations (utility): means any underground line, system or facility used for producing, storing, conveying, transmitting, or distributing communication or telecommunication, electricity, gas, petroleum and petroleum products, coal slurry, hazardous liquids, water under pressure, steam, or sanitary sewage, but not including traffic signal control cables and vehicle detection cables of the North Carolina Department of Transportation.

5.0 PROCEDURE:

5.1... Visit the jobsite, evaluate and determine the scope of the work necessary to perform excavation (Refer to Planning DOP).


5.2... Use white utility marking paint and outline the Proposed Trench and Excavation area. **Measure** depth of sanitary sewer mains entering existing Manhole and arrange for the mobilization of appropriate machinery, materials, shoring apparatus, and assistance from authorized contractors as needed i.e. Coring and Tapping Firms and Tree Removal Agencies. Verify with Code Enforcement the presence of Right-of-Ways and recorded easements.

5.3... Contact the One-call notification center (811) for utility locating following the guidelines outlined in NC One Call DOP and follow OSHA Standards regarding encounters with Underground installations (utility) (Refer to illustrations 5.3(a)).

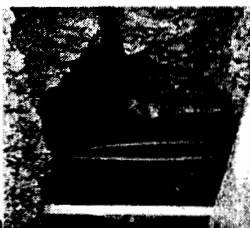
1926.651(b) Underground installations (utility).

1926.651(b)(1)___The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

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1926.651(b)(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.



5.3(a)

5.4... Insure that all surface encumbrances located within the excavation area which create a hazard, shall be removed or supported as necessary, to safeguard all stakeholders. Notify utility owners of surface encumbrance (Refer to illustrations 5.4(a-c)). Adhere to the following OSHA Standard:

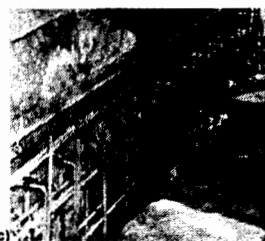
1926.651(a) Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.



5.4(a)



5.4(b)




5.4(c)

5.5. If jobsite is not marked within the allotted forty eight hour time frame or an emergency notification is required proceed with the following recommendations.

1st... Notify the NC One Call notification center if the requested locates have not been performed. A ticket number may be requested by the customer service representative.

2nd... In the event of an Emergency allow a minimum of two hours for the contract

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utility locating agency to respond.

5.5.1... If no response; adhere to the following OSHA Standard and guideline:

1926.651(b)(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, **the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used (Refer to Test Hole D.O.P on how to proceed when there has not been a response from the contract utility locating agency(ies)).**

5.6... Recognize that a by pass pumping system may have to be installed at any stage through out the excavation operation to accommodate and promote a safe dry working environment. (Refer to By Pass Pumping DOP)

5.7... Review the initial traffic control plan with field staff and set Temporary Traffic Control Devices prior to any field work activities.

5.8... Make the proper notifications to City of Raleigh stakeholders, residents, and organizations affected by excavation/trenching field operations (Refer to Planning DOP).

5.9... Review the approved Personal Protective Equipment required for this type of work.

5.10... When excavation is in paved surfaces: Mark the area to be saw cut to compensate for the width and length of the trench and Protective Support System i.e. trench shields (boxes). Saw cut concrete sidewalks, curbs and gutters, and adhere to the guidelines outlined in the City of Raleigh Public Utilities Department Handbook, Pavement Removal and Replacement section.


a.) All pavement to be removed shall be cut along straight lines with the appropriate saw cut machine. A street cut permit is required. The removal and replacement of the pavement shall conform to information shown in City of Raleigh Public Utilities Department Handbook Details S-1 thru S-4

5.11... Remove saw cut material with excavator and load on dump trucks and transport to the appropriate dumping facility. Adhere to the following OSHA Standard when Exposed to falling loads:

1926.651(e) Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of

Comment [CU1]: Should we delete the word "replacement" and list who is contacted at Street Maintenance. Can someone produce Street Cut Form?

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vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

5.12... Proceed with the guidelines outlined in Test hole DOP and adhere to the following OSHA Standard:

1926.651(b)(3) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

1926.651(b)(4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

1926.651(d) Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

5.13... Preventing Failure and Damage: recognize the need to stabilize adjacent structures with a Support system. Adhere to the following OSHA Standards:

1926.651(i) Stability of adjacent structures.

1926.651(i)(1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

1926.651(i)(2) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:


1926.651(i)(2)(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

1926.651(i)(2)(ii) The excavation is in stable rock; or

1926.651(i)(2)(iii) Accepted engineering practices: A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

1926.651(i)(2)(iv) Accepted engineering practices: A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

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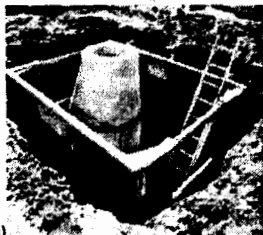
1926.651(i)(3) Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

5.14... Continue to remove enough earthen material to allow staff members to test hole and utilize probing rods and hand tools to find the targeted sewer main in order to better align the excavation effort, or until staff members are no longer permitted to enter the excavation because the City of Raleigh 4 1/2 foot trench depth standard has been met, or the competent person has recognized that the condition is unsafe for occupancy at any depth.

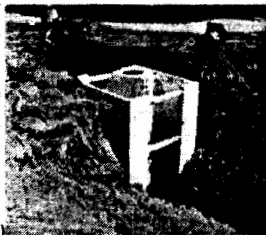
5.14.1 Damage of existing sewer piping and sewer manhole structures may occur during the excavation process. Debris from these structures shall be discarded/removed in order to facilitate safe working conditions and installation preparations.

5.14.2 Protective Support Systems and hazardous atmosphere monitors shall be used in unison during the installation and replacement process. (Refer to illustrations 5.14(a-b) for examples of Protective Support Systems).

Trench shields (boxes)




5.14(a)



5.14(b)

5.14.3...Secondary Protective Support applications on Easements is to Slope the sides of the trench 34 degrees. Slope excavations 20 feet or less in depth shall have a maximum allowable

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slope of 1 ½:1 or 34 degrees in previous excavated soils (Class C soil). Maintain two foot soil set backs and place materials perpendicular to trench so that they do not roll and strike individuals performing work in the excavation (Refer to illustrations 5.14(d-e)). The sloping process shall be utilized to prevent cave-in(s).

5.13(d) Proper Slope



5.14(d)

5.13(e) Improper Slope



5.14(e)

Comment (CU2): do we want to change illustration header.

5.15... Expose Sewer Pipe:

5.15.1... Remove earthen material to completely expose targeted sewer mains.

NOTE: A by pass pumping system may be required.


5.16... Account for size of manhole bases and remove existing sewer piping to accommodate for base installation.

5.17... Prepare the manhole sublevel base and adhere to the guidelines outlined in the City of Raleigh Public Utilities Department Handbook, "Details" section, DWG. NO. S-20.

Refer to Appendix City of Raleigh Public Utilities Department Handbook, "Details" section, DWG. NO. S-20. Follow Requirements in drawing.

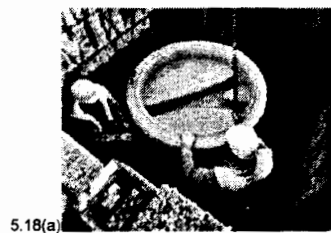
5.18... If coring is necessary; adhere to the guidelines outlined in the City of Raleigh Public Utilities Department Handbook, Pg. 152 of part 19, "MANHOLES", guideline(h).

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--All main and service pipe connections into manholes must be cored with a concrete coring machine and the connection must be made with a flexible rubber boot.

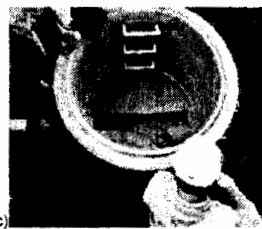
5.18.1 Place bottom section of manhole, and subsequent sections of manhole, (aligning the steps if present) to measure where the sewer pipe will attach/enter the manhole (Refer to illustrations 5.18(a-c)).



5.18(a)



5.18(b)



5.18(c)

5.19... Remove appropriate manhole sections for coring and boot installation (Refer to illustrations 5.19(a-c)).



5.19(a)



5.19(b)




5.19(c)

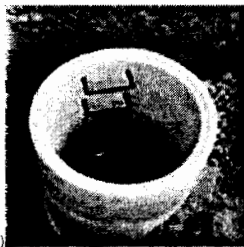
5.20... Install cored manhole sections realigning the steps and connect sewer pipes (Refer to illustration 5.20(a-b)).

Realigning Steps

Connect Sewer Pipes

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5.20(a)



5.20(b)

5.20.1 Utilize small semi symmetrical pieces of brick to wedge between the rubber boot and cored concrete surface as a stabilizing material on the exterior wall of the manhole so pipe does not float.

5.20.2 Utilize sufficient number and size of whole brick beneath the sewer pipe as a stabilizing material on the exterior wall of the manhole and at the attachment point of the existing sewer line beneath the new section of installed pipe and behind the installed femco.

5.21... All exposed sewer pipe shall be bedded in # 57 stone to the spring line of the pipe (Refer to Appendix M).


5.22... Install additional manhole risers as needed utilizing waterproofing guidelines outlined in the City of Raleigh Public Utilities Department Handbook, Pg. 151 of part 19, "MANHOLES", guideline (g).



-- All manhole joints must be waterproofed with asphaltic cement or "ram-neck". All exterior joints shall be wrapped with a butyl resin sealant of 8" width.

5.23... Follow backfill and manhole rim/lid installation DOP's


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Appendix M


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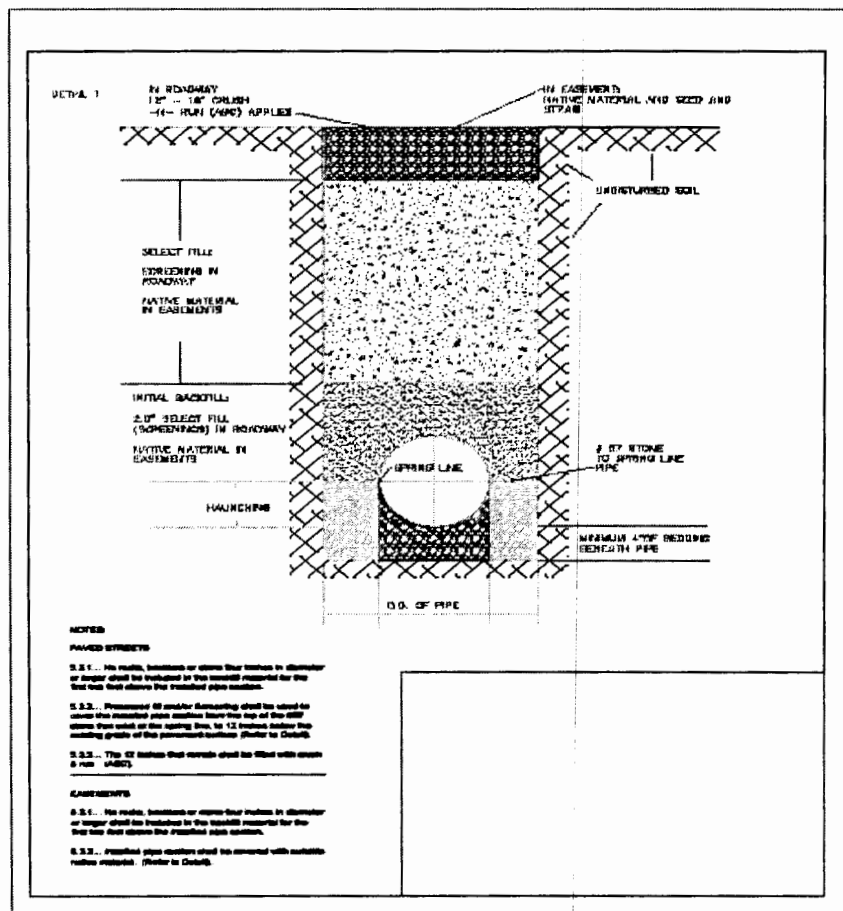
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<div><p>SUBJECT</p></div> <div><p>Installation and Replacement of Sanitary Sewer Manholes</p></div>		<div><p>NUMBER</p></div> <div><p>SER-0004</p></div> <div><p>SUPERSEDES</p></div>	<div><p>REV</p></div> <div><p>PREPARED BY</p></div>	<div><p>EFFECTIVE DATE</p></div>	<div><p>PAGE</p></div> <div><p>12</p></div> <div><p>OF</p></div> <div><p>13</p></div> <div><p>Approved by</p></div>


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<div>SUBJECT</div> <div>Installation and Replacement of Sanitary Sewer Manholes</div>	<div>NUMBER</div> <div>SER-0004</div> <div>SUPERSEDES</div>	<div>REV</div> <div>PREPARED BY</div>	<div>EFFECTIVE DATE</div>	<div>PAGE OF</div> <div>13 13</div> <div>Approved by</div>




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- 1.0 **PURPOSE:** To provide a stable entrance/exit condition from the construction site and keep mud and sediment off public roads.
- 2.0 **ORGANIZATIONS AFFECTED:**
CORPUD SEWER MAINTENANCE AND WATER DISTRIBUTION DIVISION
AUTHORIZED CONTRACTORS
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL CONSULTANT
CODE ENFORCEMENT
HOME OWNERS ASSOCIATIONS (HOA)
- 3.0 **REFERENCE:**
- Erosion and Sediment Control **Field Manual**
February 1991 Cooperative effort between the North Carolina Department of Environment, Health and Natural Resources, and the North Carolina Agricultural Extension
 - Manual on Uniform Traffic Control Devices for Streets and Highways (2009 edition)
 - North Carolina 811 Excavation Guide (www.nc811.org)
 - The State of North Carolina Underground Damage Prevention Act
General Statute 87.106
 - American Public Works Association (APWA) (<http://apwa.net/>)
 - OSHA standard 1926 Subpart P – Excavations.
 - OSHA standard 1926 Subpart G – Signs, Signals, and Barricades
 - City of Raleigh Public Utilities Department Handbook
 - North Carolina Department of Transportation Maintenance / Utility Traffic Control Guidelines
 - Manual for Uniform Traffic Control Devices
 - Operation and Maintenance of Wastewater Collection Systems, Vol. I
- 4.0 **DEFINITIONS:**
- Color Code Assignments:** The North Carolina 811 One Call Center and its utility marking subsidiaries' adhere to the APWA Uniform Color Code for marking underground utility lines.
- White Marking Paint—is used to mark and outline the Proposed Excavation area.
 - Pink Marking Paint—Indicates Temporary Survey Markings
 - Red Marking Paint—Indicates the presence of Electric Power Lines, Cables, Conduits and Lighting Cables
 - Yellow Marking Paint—Indicates the presence of Gas, Oil, Steam, Petroleum or Gaseous Materials (such as oxygen lines at local Hospitals)
 - Orange Marking Paint—Indicates the presence of Communication, Alarm or Signal lines, Cables, Cable Television (CATV) or Conduit
 - Blue Marking Paint—Indicates the presence of Potable Water and Chilled Water
 - Purple Marking Paint—Indicates the presence of Reclaimed Water, Irrigation, and

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Slurry lines

- Green Marking Paint—Indicates the presence of Sewers and Drain lines

Damage: includes the substantial weakening of structural or lateral support of an underground utility, penetration or destruction of protective coating, housing, or other protective device of an underground utility, and the partial or complete severance of an underground utility.

Excavate: or "excavation" means an operation for the purpose of the movement or removal of earth, rock, or other materials in or on the ground by use of equipment operated by means of mechanical power and/or an operation by which a structure or mass of material is wrecked, razed, moved, or removed by means of any tools, equipment, or discharge of explosives. This term includes road construction but does not include road maintenance activities within rights-of-way of a highway, including those maintenance activities defined by the rules and regulations of the North Carolina Department of Transportation.

One-call notification center: An entity that administers a system through which a person can notify utility owners and operators of a proposed excavation. Typically, the one-call center notifies member utility owners and their utility marking subsidiaries', to mark the ground surface for existing underground utilities.

One-call statute: A local or state requirement that an excavator or designer of excavation call a central number to notify some or all existing utility owners of that planned excavation.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT is a stabilized entrance to a construction site and is designed to minimize the amount of sediment tracked from the site from vehicles and equipment unto paved roads.

Test hole: The excavation made to determine, measure, and record the presence of a utility structure.

Tolerance Zone and Location of underground utilities: means a strip of land not wider than the width of the underground utility plus two and one-half (2 1/2) feet on either side of the underground utility.


Underground utility: means any underground line, system or facility used for producing, storing, conveying, transmitting, or distributing communication or telecommunication, electricity, gas, petroleum and petroleum products, coal slurry, hazardous liquids, water under pressure, steam, or sanitary sewage, but not including traffic signal control cables and vehicle detection cables of the North Carolina Department of Transportation.

Utility: A privately, publicly, or cooperatively owned line, facility, or system.

Utility attribute: A distinctive characteristic of a utility that may include, but is not limited to, elevation, horizontal position, configurations of multiple non-encased pipes or cables, shape, size, material type, condition, and age.

Utility locating: is the process of identifying, marking, and depicting the presence of underground utilities; such as telephone, electric, natural gas, cable television, fiber optics, traffic control lights, street lights, storm drains, water mains, and wastewater pipes within prior to an area

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about to be excavated. Additional underground utilities may include; major oil and gas pipelines, national defense communication lines, mass transit, road, rail, steam and chilled water utility tunnels.

Utility owner: means any person who owns or operates an underground utility.

5.0

PROCEDURE:

5.1... Visit the jobsite and evaluate and determine the scope of the work addressing the following:

- 1.) Verify the location, address, and problem from the maintenance requests.
- 2.) Ensure Code Enforcement has verified that work is being performed on a City of Raleigh maintained easement
- 3.) Establish traffic control plan at time of site visit; fill out street cut/street closure permits, pertinent documents, maps, and handout notification forms, if necessary begin distributing this information to any/all City of Raleigh stakeholders, residents, and managing officials via email or other predetermined modes of communication.
- 4.) Establish the ingress/egress point of the easement, spacing requirements for staging materials/equipment, stability, saturation (wet conditions), and slope of ground surface, presence of manhole structures which may impede entry, and machinery needs.
- 5.) Obtain property owner permission when entering work zone on private property. Completion of PUD encroachment agreement form shall be required.


5.3... Follow the procedures and guidelines established in the NC One Call DOP to address the access point in case an area requires grading and earthwork to allow machinery and hauling vehicles to enter the construction site.

5.4... Prior to any/all construction type operations establish the Work Zone by setting early warning traffic control signs, barricades, and channeling devices adhering to the following OSHA Standards which dictate:

--1926.200(g)(2) subpart g

All traffic control signs or devices used for protection of construction workers shall conform to Part VI of the Manual of Uniform Traffic Control Devices (AMUTCD"), 1988 Edition, Revision 3, September 3, 1993, FHWA-SA-94-027 or Part VI of the Manual on Uniform Traffic Control Devices, Millennium Edition, December 2000, FHWA, which are incorporated by reference. The

DEPARTMENTAL OPERATING PROCEDURES

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Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51.

--1926.651(d) subpart p __ Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear; warning vests or other suitable garments marked with or made of reflectorized or high-visibility material. A ANSI CLASS II or ANSI CLASS III vest shall be worn.

5.5... Follow the guidelines outlined in Erosion and Sediment Control Field Manual for TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

5.5.1... Minimum Requirements:

Material: 2-3-inch surge stone over a stable foundation.

Thickness: 6 inches minimum

Width: 12 ft minimum or full width of exit roadway, whichever is greater.

Length: 50 ft minimum.

Washing facility (if required): level area with 3-inch surge stone minimum, or a commercial rack. Divert wash water to a sediment trap or basin.

5.5.2... Installation:

Attempt to locate access in areas with good vertical and horizontal sight distance. Remove all vegetation and other objectionable material from the foundation area. Grade and crown foundation for positive drainage.

If the slope toward the road exceeds 2%, construct a ridge, 6 to 8 inches high with 3:1 side slopes, across the foundation approximately 15 ft from the entrance to divert runoff away from the public road.

Place geotextile fabric on the graded foundation to improve stability, especially where wet conditions are anticipated.

Place stone to dimensions and grade to accommodate heavy loads and hauling volume. Leave surface smooth and sloped for drainage.


Divert all surface runoff and drainage from the stone pad to a sediment trap or basin

Install pipe under pad if needed to maintain proper public road drainage.

5.5.3... Maintenance:

Inspect entrance/exit pad and sediment disposal area weekly and after heavy rains or heavy use.

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Reshape pad as needed for drainage and runoff control.


Topdress with clean stone as needed.

Immediately remove mud and sediment tracked or washed onto public road.

Repair any broken road pavement or walking surfaces immediately.

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DEPARTMENTAL OPERATING PROCEDURES

<div>City of Raleigh, NC</div> <div></div>	<div>MANUAL</div> <div>Sewer Maintenance</div> <div>Utility Management System Manual</div>			
<div>SUBJECT</div> <div>CCTV Inspections</div> <div>CCTV</div>	<div>NUMBER</div> <div>CCTV-0001</div>	<div>REV</div>	<div>EFFECTIVE DATE</div>	<div>PAGE OF</div> <div>1 4</div>
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1.0 **PURPOSE:**

The purpose is to provide instructions for the proper monitoring and recording of Sanitary Sewer Mains to perform condition assessments of Sanitary Sewer infrastructure through the use of Closed Circuit Television (CCTV).

Standardization to ensure all CCTV operations are done uniformly across the different operation centers.

2.0 **ORGANIZATIONS AFFECTED:**

Raleigh Sewer Operations
South Raleigh Sewer Operations
North Raleigh Sewer Operations
East Raleigh Sewer Operations

3.0 **REFERENCE:**

Manual for Uniform Traffic Control Devices (MUTCD)
NCDOT Utility Traffic Control Guidelines
DOP XXX (temporary traffic control devices)

4.0 **DEFINITIONS:**

NASCO Pipe Rating System
Footage: Linear feet from manhole to manhole on one pass, regardless of # of passes required to clean lines.

5.0 **PROCEDURE:**

5.1 Acceptance of CCTV work order based upon:

- New Main installation
- Preventative Maintenance (PM)
- Trouble Call (Internal/External)
- Follow-up Inspections of maintenance repairs or flushing operations


5.2 Upon arrival to the job site proper warning signs must be placed to alert traffic of the work zone. (See DOP on how to mark job site)

5.3 Once CCTV truck is in position traffic cones will be placed around work area for safety.

5.3 All PPE shall be worn including Hard Hat, Safety Vest, and Gloves.

5.4 Before opening the manhole the gas monitor will be placed at the top of the manhole for atmospheric testing prior to opening; if no holes in top of manhole the top will be partially

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opened (2-3 inches) and the hose will be placed in the top for testing.

5.5 Once manhole is open the operator will place safety rails around manhole opening and test atmospheric conditions in the manhole starting from the top and working to the bottom of manhole to make sure no hazardous atmospheric conditions exist; if condition exists the line will be purged using gas or electric air blower in upstream manhole until no hazardous atmospheric conditions exists.

5.6 Operator will lower camera into manhole invert going down stream, if conditions prevent televising downstream, the camera will be placed going up stream.

5.8 When televising, a manhole roller shall be used at all times to prevent damage to the cable from rubbing against manhole ring.

5.9 Manhole will continuously be monitored for hazardous atmospheric conditions during the CCTV operation.

5.10 Assistant will go to next manhole where camera is headed and wait to notify operator when camera arrives.

5.10-A If manhole is in street the assistant will take 2 traffic cones and set them around manhole and the assistant will stay inside of cone perimeter while in the street for safety.

5.11 The following information will be recorded on each work order created for each job:

5.11-A Address or location of job.

5.11-B Size of pipe.

5.11-C Type of pipe, i.e. plastic, ductile iron, cement, clay

5.11-D Type and depth of manhole, i.e. stone, brick, concrete

5.11-E Map page and letter from Street Index Book

5.11-F Type and amount of debris found, i.e. heavy grease, light roots

5.11-G Date, Start and Stop time


5.11-H Gas Monitor Readings

5.11-I Whether work was either preventative or corrective maintenance

5.11-J Types of problems found and if problem is City or home owner problem

5.11-K If televising for possible homeowner notify homeowner before and after start

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of job and let homeowner know outcome if home, if not home a door hanger will be left notifying them of results.

5.11-L Record any defects found in pipe and print copy of picture and attach to repair order for repair crews.

5.11-M Record the direction of CCTV work whether in street, behind or beside house and whether going up or down stream.

5.11-N Record all equipment, crew member names and if work hours are straight or over time.

5.11-O All items received from warehouse will be put on work order including inventory I.D. #, amount, name of item and truck items received to. A warehouse inventory receipt will be turned in with work order.

5.11-P Sewer lines will be rated using NASCO Rating System, 1 being best and 5 being worst.
(ADD: Footage to be recorded to workorder)

5.12 For large outfall lines the surf board or boogie board will be used to float camera down line when flow cannot be taken off line.

5.12-A Float guide rope from manhole to manhole in section to be televised and connect to each end of board.

5.12-B One person will be at each manhole to guide board and camera and float camera between manholes.

5.13 No sewer service will be televised unless a cleanout is at right of way or unless directed by supervisor. The home owner is responsible for installing the cleanout; we do not televise services that run to an easement.

5.14 Each time CCTV truck moves to a new location a new work order will be generated using the previous steps.

5.15 When job is completed crew will make sure all tools and equipment are loaded up on truck before signs and cones are removed then signs and cones will be picked up when crew leaves job location.

5.16 Add information regarding sonde.....